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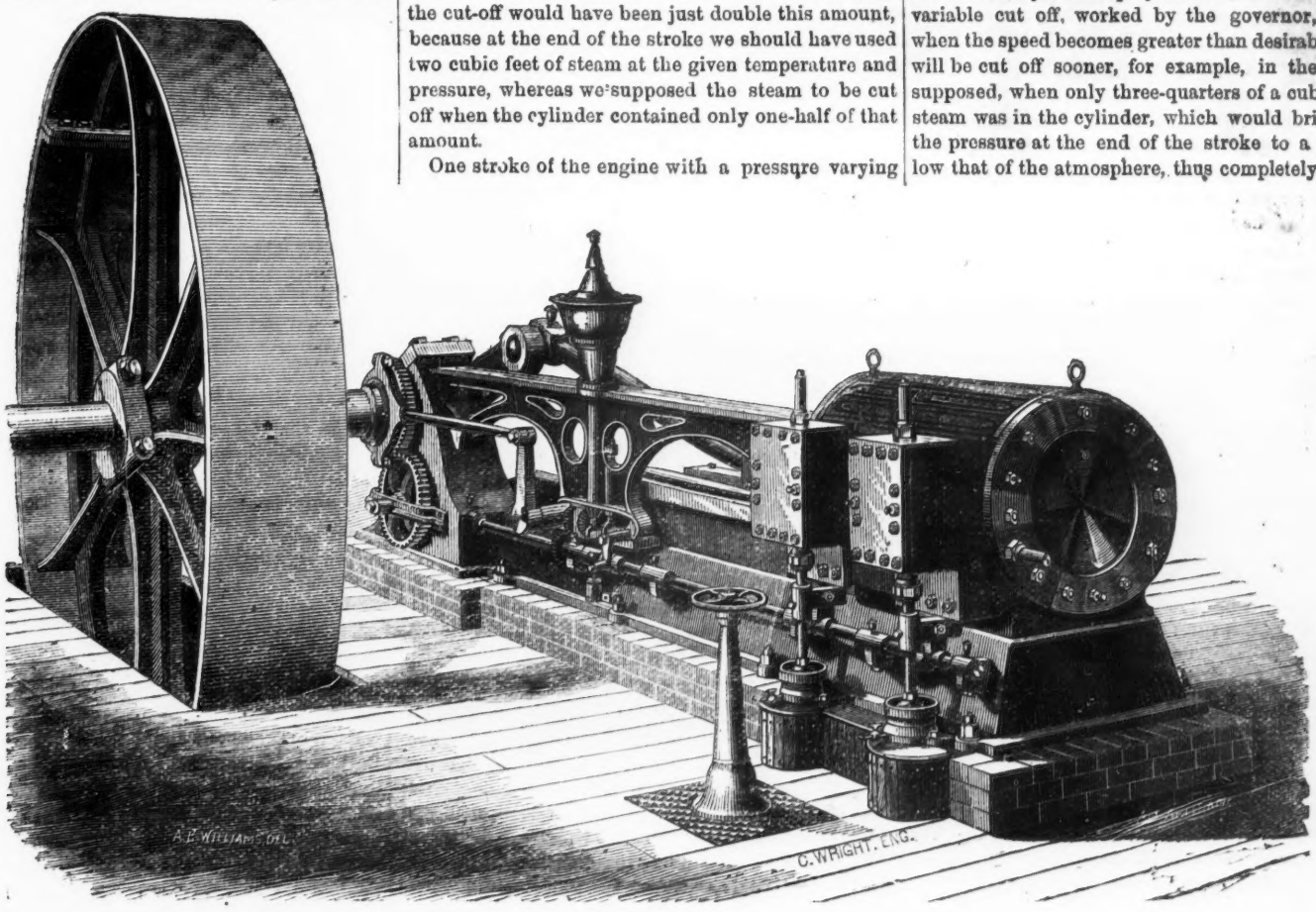
Wright's Steam Engine.

MANY of our readers doubtless visited the recent fair of the American Institute, and there saw in operation the Wright engine which we herewith illustrate and which occupied the most prominent position in the machinery department.

It is well understood, among all mechanical engineers, that in order to achieve the greatest possible economy in the use of steam, it must be used expansively. The sensible heat of steam bears a direct relation to the force stored up in it, and it is evident that if we allow steam to leave the cylinder with



nearly as high a temperature as it had when it entered, or in fact at a temperature greatly above 212°, a certain amount of heat which could have been converted into motion, is lost. The only way in which this loss can be prevented is to cut off the steam from the cylinder before the stroke is completed, and to allow the steam already in the cylinder under a high pressure, to expend at least a portion of its force in work against the piston.

Let us suppose, for example that we are working a high pressure engine, with forty pounds pressure to the square inch. The steam entering the cylinder will have a sensible temperature of 267° F. Suppose that when a space of one cubic foot behind the piston is filled with steam at this pressure and temperature we cut off the supply. Suppose further the entire cubic contents of the cylinder to be two cubic feet. For the first instant the piston will be actuated by a force of forty pounds to the inch, but this pressure will immediately commence to fall off, and when the stroke is completed we shall have a pressure of between eighteen and nineteen pounds, and a temperature of about 224° having thus utilized 43 degrees of heat, which would have been lost in the exhaust steam, had we allowed steam to be supplied to the cylinder till the stroke was completed. This is very easily understood and a minutes reflection will make it clear that the actual loss without the cut-off would have been just double this amount, because at the end of the stroke we should have used two cubic feet of steam at the given temperature and pressure, whereas we supposed the steam to be cut off when the cylinder contained only one-half of that amount.

One stroke of the engine with a pressure varying from forty pounds to nineteen, will not be able to perform as much work as though the pressure had been forty pounds throughout, still it will have done much more than half that amount of work, and we shall have saved enough steam for another stroke. We have seen that by cutting off at half stroke, we still had a pressure of nineteen pounds to the inch, in the cylinder at the end of the stroke and every engineer knows that this is sufficient to do a good share of work. It would appear at first glance, that if a cut-off engine did not use as high a pressure throughout the stroke as an old fashioned engine, we would have to employ a larger area of piston, in fact to use a larger engine to develop the same power, but this has generally been avoided by adopting a higher piston speed, or in other words so arranging the parts of the engine and making such combinations of pulleys, that the engine will make an increased number of revolutions per minute. It will be observed that that the slow moving engines of former days are now seldom used, especially by intelligent and progressive men.

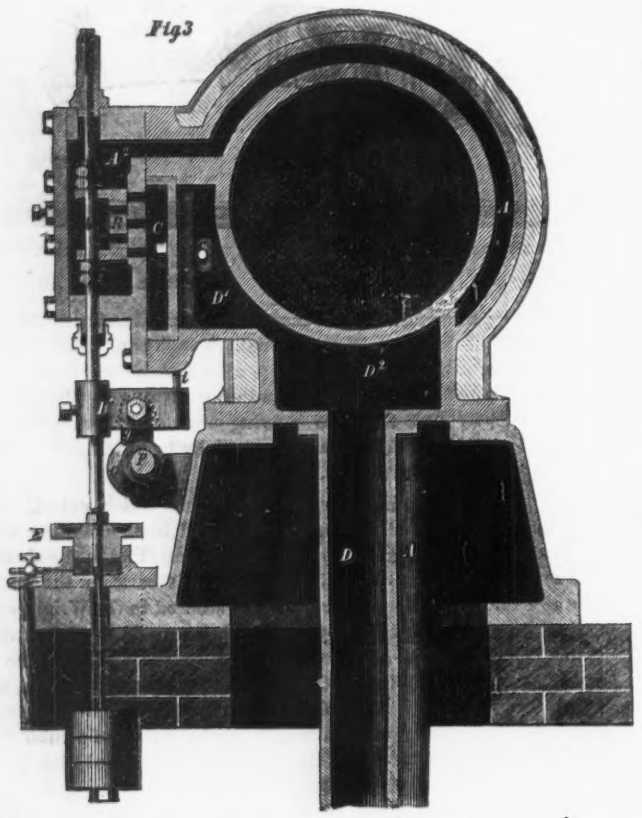
If, however, we had engines which cut-off, say at half stroke only, we should lose one other advantage gained in modern engines, that is the ability to use steam still more expansively when the work becomes lighter. This is secured in the Wright engine and others, by the employment of, what is called a variable cut off, worked by the governor, so that when the speed becomes greater than desirable, steam will be cut off sooner, for example, in the case we supposed, when only three-quarters of a cubic foot of steam was in the cylinder, which would bring down the pressure at the end of the stroke to a little below that of the atmosphere, thus completely utilizing the force of the steam, available in a non-condensing engine.

The engine which we herewith illustrate is provided with a simple and reliable variable cut off, the action of which can be pretty well understood from a close inspection of the perspective view on this page.

The governor, which is contained in an urn-shaped box placed just above the framing, is driven by gearing from the shaft of the engine. The prolongation of the rod which carries this gearing, carries also the cams shown in figs. 4 and 5, which operate the vertical steam valves. These cams are of a conical form, being of course eccentric on the revolving shaft. A lever moved by the stem of the governor gives this shaft a longitudinal motion, which brings the smaller

end of the conical cam under the valve-stem when the engine is running too fast, thereby admitting steam only for a short time at the commencement of the stroke. When, however, the load is increased

Fig3



the rod is moved in the opposite direction and a portion of the cam nearer the base of the cone is made to raise the valve so that it remains open longer.

The exhaust valves, which have an entirely independent motion, are worked by an eccentric and rock-shaft shown in our perspective view.

In the sectional view fig. 3 are shown the arrangement of the valves, the position of the steam supply pipe A, the steam jacket A_1 the conical cam G, the lifter B on the valve stem, and the weight attached to the lower end of this stem to close the valve. The steam-pipe, A, passes through the bed-plate, and connects with a passage, A_1, partly surrounding the cylinder, and communicating with the upper part of the chest, A_2. The eduction takes place through a passage, D_1, and a chamber, D_2, with which the exhaust-pipe, D, connects, said pipe, like the induction-pipe, passing through the bed-plate.

The workmanship on every part of this engine is of an excellent quality. The connecting rods as well as the piston rods, valve stems, and connections are of steel. The cut-off cams and their saddles are of the same material and hardened. The engravings are taken from an engine of sixteen-inch cylinder and thirty-two inch stroke, exhibited in the American Institute Fair in New York. Engines of various sizes, up to one hundred and fifty horse-power, are manufactured by WILLIAM WRIGHT & Company, Newburg, N. Y.

The Moneres and Spontaneous Generation.

From the "BIOLOGISCHE STUDIEN" of Dr. ERNST HAECKEL.
By Dr. ADOLPH OTT.

[CONCLUDED FROM PAGE 275.]

THE argument that life cannot develop itself from inorganic matter, because we cannot artificially produce certain organic compounds by combining in our laboratories inorganic elements, is not conclusive. If it proved anything, it would prove too much. For we can adduce many different minerals, such as felspar, fluorspar, barytes, augite, etc., and many other crystals of inorganic origin, which to the present day have not been imitated from nature. Persons who draw positive conclusions from the yet imperfect stage of chemical knowledge, may assume that there are two great classes of natural substances, the one of which draws its origin from supernatural "creation," simply because our most skillful chemists have not yet succeeded in explaining how it originated.

But to be consistent, such persons must divide the material universe into two classes, the natural and the supernatural world. The first class would contain the simple combinations of elements (metals and metalloids) such as water, oxides, acids, most salts, and in general all "inorganic compounds" that can be artificially produced. But it must include carbonic acid, the hydrocarbons and other simple compounds of carbon, such as alcohol, acetic acid, etc., which are liable to be produced artificially. All substances of this class would be acknowledged to originate by "spontaneous generation," that is, by a natural, mechanical process, or the co-operation of the chemical and physical forces inherent in matter. The supernatural world, on the other hand, would embrace felspar, fluorspar, barytes, augite, in fact, all minerals which we cannot yet produce by chemical synthesis; furthermore, all the more complicated carbon-compounds (albuminous substances, hydrocarbons, chitine) which chemists have thus far failed in producing. All the substances in this class would be asserted to have originated by "creation," that is, in a supernatural way, by the effect of mysterious forces, operating from without.

In comparison with this, the assumption of a spontaneous generation for the first living organisms, from which all others have sprung, is certainly a logical and justified consequence of scientific reflection.

We need hardly be surprised at the fact, that the primary generation of the *moneres* has as yet not been observed by the eye of man. Even if this process were taking place daily and hourly, it would be exceedingly difficult to observe. If only searched for, protoplasmic particles of the most minute size may be seen floating in immense quantities, both in salt and fresh water. Microscopists, who detect them occasionally, are apt to suppose them to be destroyed fragments of organisms on their way to dissolution. But, where are the proofs for their opinion? And, who will give us the strict proof, that the albuminous particles just spoken of, have not originated by spontaneous generation? Even if we suppose that new *moneres* originate daily spontaneously, that they neither originate rarely nor in small quantities, it would nevertheless be exceedingly difficult to observe directly their formation or to follow it up. The origin of a protoplasmic substance in a liquid, answering to all conditions necessary for spontaneous generation, will take place suddenly and will oppose to investigation the same obstacles as the generation of a crystal in its mother-lye. And not an easier matter will be the observation of the slow processes of growth, by which the exceedingly small, scarcely perceptible plasma-particles shape themselves into the larger plasma-bodies of the *protomœbes*.

Among the *moneres* known at present, *Bathybius* is perhaps of the highest importance for the hypothesis of primary or spontaneous generation. The amazing quantities of nude, living protoplasma, which, according to HUXLEY's memorable discovery, cover the deepest abysses of the ocean, and of which I have given a detailed account in my "*Beiträgei zur Plastidentheorie*" (Contributions to the theory of Plastides), tend to prove that primary generation is still going on; indeed, they make it more probable than any other fact known. From what should otherwise these protoplasma-coatings of the ocean bed be derived? What other source shall we adopt for them?

Fig4

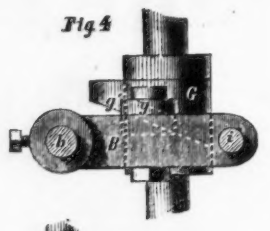
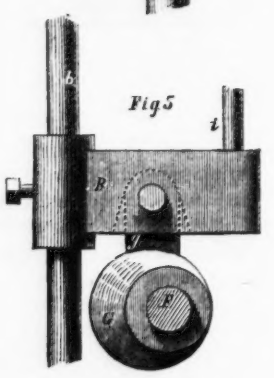


Fig5



Let us remember well, that in view of the still living *moneres*, and especially of *Bathybius*, we are necessarily put to the following alternative:—Either the *moneres* have but *once* sprung into existence by spontaneous generation and at the beginning of organic life upon the planet—from which it would result that they propagated themselves through millions of years down to our days;—or *moneres* have come into existence at different epochs of the history of terrestrial organisms and through repeated acts of primary generation. In this case it is not to be seen, why this process should not daily repeat itself. On examination of all the intricate facts connected with this problem, in an impartial and unprejudiced manner, it will be found that the last mentioned hypothesis meets with the least theoretical difficulties. To conclude, we would say, that in any case, the now living *moneres* put us in the way of a more thorough understanding of the origin of life, and that they remove the obstacles which most obstinately opposed themselves to the hypothesis of spontaneous generation.

EDITORIAL CORRESPONDENCE.

The Sheba Mine.

(CONTINUED.)

STAR CAÑON, HUMBOLDT CO., NEVADA.
September, 1871.

After several years of abandonment, the property came into the hands of its present proprietors, and work was resumed under the direction of Mr. SAMUEL STEWART, superintendent of the well-known Arizona mine at Unionville, Mr. RICHARD NASH having immediate charge of the operations. The latter, who was for many months in the employ of the old Sheba Company, and possessed perfect familiarity with the history of their operations, has made good use of the experience of the past. After some further exploration along the hanging wall, resulting in nothing more than the discovery of small outlying pockets—mere remnants of the old bonanza—he resolved to follow the indications of the slips and stringers in the veinstone, and to look for a main body further east than any workings had previously gone. Accordingly he drove a tunnel northward into the belt from the cañon, and cross-cutting towards the foot-wall, considerably under the old works, struck, at a distance of about 650 feet from the tunnel-mouth, a large, well-defined, and rich vein.

It is now perfectly clear that the numerous stringers and threads of quartz traversing the channel of veinstone drop to the footwall, upon which they unite to form the vein. The bodies found in the old

Sheba mine were within the wide channel, but far outside of the ore-vein now disclosed. Such outlying chambers are of frequent occurrence in ore-deposits of this character.

The vein recently opened has been exposed by a drift for about 100 feet in length. Stoping has been carried on for about 25 feet above this drift, and a winze has been sunk below the drift about 15 feet. The minimum width of quartz and ore is 20 inches, the maximum 9½ feet, by measurement in the roof of the stope. This large width constitutes a bulge in the vein about 16 feet in horizontal length. At the bottom of the winze there is a four-foot vein. The average width of the ore-vein throughout these exposures is 4½ feet. At the north end of the opening it is somewhat scattered, but recovers itself beyond and below. At the south end there is a clay-seam cutting and heaving the vein. At the time of my visit (Sept. 6) a short cross-cut was in progress, to strike the vein beyond this break; and a characteristic band of black rock, which everywhere accompanies the vein-walls, and which has been seen nowhere else in the mine than in that position, had already been struck in the cross-cut, leaving no reasonable doubt of the immediate vicinity of the ore. The vein where it is cut off has its maximum width, and the cross-seam is so thin and smooth, and gives so "clean" a cut (without broken ground), as to indicate but a very small heave.

The structure of the vein is perfectly regular and normal in appearance. Vugs and combings occur in it frequently, as well as a banded structure which promises excellently for both permanence and quality. The clay partings are thin; and the foot-wall is hard and well-defined. Although so many stringers are dropping in from the hanging-wall, to swell the dimensions and value of the vein, none have ever been found to penetrate the foot-wall.

The course of this vein by compass is N. 11 W. by S. 11 E. The dip varies from vertical, and in one place, 70° E., to 60° W. The immediate gangue is quartz, and the ore is principally fahlerz and argentiferous zincblende. The first-class ore, comprising apparently about five per cent. of the whole, is worth from three hundred to five hundred dollars per ton. The second-class ore (judging from its appearance as compared with what I remember of the old Sheba ore) should be worth fifty to seventy-five dollars.* The mill of the Sheba company, formerly situated at the north of the cañon, was sacrificed and lost during the pecuniary embarrassments and confusion of an interregnum; but a small water-mill has been erected in the cañon, containing five stamps and a small number of concentrating machines, for the purpose of crushing and concentrating the ore thrown aside as unprofitable during the former workings. This mill is run at a small profit, in spite of the great waste of silver involved in the use of wet concentration upon ores containing brittle compounds of silver.

These ores consist of sulphurets of silver, argentiferous fahlerz and zinc blende, the last mineral having been found by separate assay to carry a high value in silver.

The true method of treatment would be to roast with salt all the ores, of every grade, in the Stetefeldt furnace, the Brückner cylinder, or the ordinary reverberatory, and then extract the silver by close amalgamation in barrels or pans. I entertain no doubt that the whole mass of the vein described can be thus treated at a handsome profit. The ore extracted during recent prospecting operations has paid all expenses, no assessments having been levied since the reopening of the mine.

So long as the two real walls (the slate and the quartzite) enclose so wide a channel, there is of course a possibility that the ore-vein may scatter through the intermediate space. But all indications prove that this will not be the case at depths below the present tunnel level. The vein having once regularly formed on the foot-wall, by stringers dropping eastwardly to that wall, may be expected to stay there in depth. The slips of the rock also dip eastward. The clay cross-seam already alluded to courses N 45 W and dips 84° E. From all these indications, as well as from the appearance of the ledge itself, which is far more persistent and regular than anything hitherto discovered in the Sheba ground, it is impossible not to believe that, though there may be outside ore-bodies in the west, there will not cease to be, from present workings downward, a strong vein on the foot-wall.

A decisive corroboration of this view is furnished by the circumstance that the two walls of the wide channel are drawing nearer together in depth. This may be clearly seen in the underground workings, and its effect will be to exclude gradually the barren ground which now occupies so large a space in the channel, and to secure, in all probability, a compact and reasonably uniform ore-bearing vein.

The facilities for working this mine are good. The company owns the whole water-right of Star Creek, and has a wagon-road, constructed at great expense, down the side of the cañon. The distance to Mill City on the Central Pacific railroad, is twelve miles, and the cost of hauling ore by teams $5 per ton. Little timber is required in the mine, and the extraction of the ore for some time to come may be cheaply carried on through the tunnel and stopes now open. Exact estimates of cost are at present impracticable, since a large portion of the work hitherto has been preliminary, and the era of regular production is but just beginning.

In conclusion, I can but emphasize the opinion, already made evident from the foregoing description, that the Sheba mine now presents, what it never did in former times, the appearance of a regular and persistent, as well as rich and profitable, ore-deposit.

R. W. R.

*The lowest assay in quantities of ten tons, of the first-class ore shipped from the mine since reopening, has been $582 per ton. The second-class ore has run $69 and upwards. My figures are therefore very low.

Notes on Lead Smelting in Nevada and Utah.

O. H. HAHN, M. E.

MINERALS containing the useful metals in such quantities and in such a chemical combination as to make their extraction profitable we term *ores*, while their earthy portions we designate as their *matrix* or *gangue*. In regard to subsequent metallurgical treatment we can make the following practical classification:

1. *Smelting ores*, viz. ores containing base metals in notable quantities.

2. *Dry ores*, viz, ores containing noble metals and no base ores, or only in limited quantities.

It is my intention to speak particularly of those pertaining to class 1.

Ores and gangue are always more or less intimately mixed. For the utilization of the metals it is therefore necessary to separate them by artificial means, which are either of a mechanical or chemical nature. A mechanical separation alone is not sufficient to produce a merchantable product, but it can serve only as preparatory to the chemical process which leads us to the art of *smelting*. Smelting, in a metallurgical sense of the word, is a conversion of solid mineral or metallic masses into the fluid state by heat and chemicals, and the subsequent separation of the metallic from the earthy ingredients by means of their specific gravity. Although there are a great many methods in vogue for utilizing lead-ores by smelting, there are only two which have found application and justly claim attention in the mining regions of the Great Basin. A, the English process of smelting in reverberatory furnaces, and B, the blast-furnace process.

The former has some marked advantages over the latter: the possibility of using raw fuel; the dispensing with blowing-engines, and hence a saving of power; easier control of manipulations, and the production of a lead of better quality in which the precious metals are concentrated. Its general application, however, is greatly impaired by the fact that only comparatively pure ores can be treated successfully. Thus, ores containing more than 4 per cent. of silica are unfit for the reverberatory process, silicate of lead being formed which impedes the process of the operation and gives rise to the formation of rich residues. In England the lead-ores subjected to this process contain about 80 per cent. of lead, the gangue generally being carbonate of lime. The English process in its unaltered form can therefore only be recommended for pure galenas with calcareous gangue—an ore not often obtained in these regions. To my knowledge there is only one establishment in operation where ores are treated by this process, that of Messrs. PASCOE & JENNINGS near Salt Lake City. Another one of this kind, that of Messrs. ROBBINS, is idle for want of the proper ores. We feel therefore justified in omitting to enter upon a more minute description of this process.

Compelled by the high prices of labor, transport of materials and products, lack of cheap mineral coal etc., the lead-smelters of the Great Basin have almost unanimously adopted the blast-furnace process of smelting. By its means we are enabled to obtain a saleable product, in the shortest possible time, and with the least expense, the residues being so poor that they can be thrown away.

To insure success in smelting lead ores—as all other ores—it is necessary to know their mineralogical character, as well as the chemical properties of the gangue in which they occur. A perfect separation of the ore from its matrix by hand being impossible, and a concentration by water being impossible, on account of the insufficient supply of the article, we have to try and convert it into a fusible compound, termed *slag*. Quartz, we know, is infusible by itself; so is lime; but, if we mix both in the proper proportions, and expose them to a melting heat, the result will be a fusible compound. It has been found by actual experience, that not the single compounds of silica and lime, or alumina, magnesia, etc., but double compounds of, say, silicate of lime and silicate of alumina, are the most fusible ones. Replacing one of those bases by alkalies, or the protoxides of the heavy metals, as for instance iron and manganese, the fusibility of a slag is increased, within certain limits. The fusibility of a slag depends principally upon the proportion of silica to the bases contained in it. Mineral substances which serve to liquefy others, not fusible by themselves, we call *fluxes*. Under favorable circumstances, an ore may contain all the slag-forming ingredients in the proper ratio, but only in a very few instances has nature graciously permitted such a coincidence, as, for example, in Eureka District, Nevada.

According to the ratio between silica and the bases we discriminate three classes of fusible slags:

1. *Bi-silicates* or *acid slags*, containing 50 per cent. of silicic acid and 50 per cent. bases, in which the former balances the latter;

2. *Singulo-silicates*, with 30 per cent. silicic acid and 70 per cent. bases;

3. *Sub-silicates*, with 20 per cent. silicic acid and 80 per cent. bases.

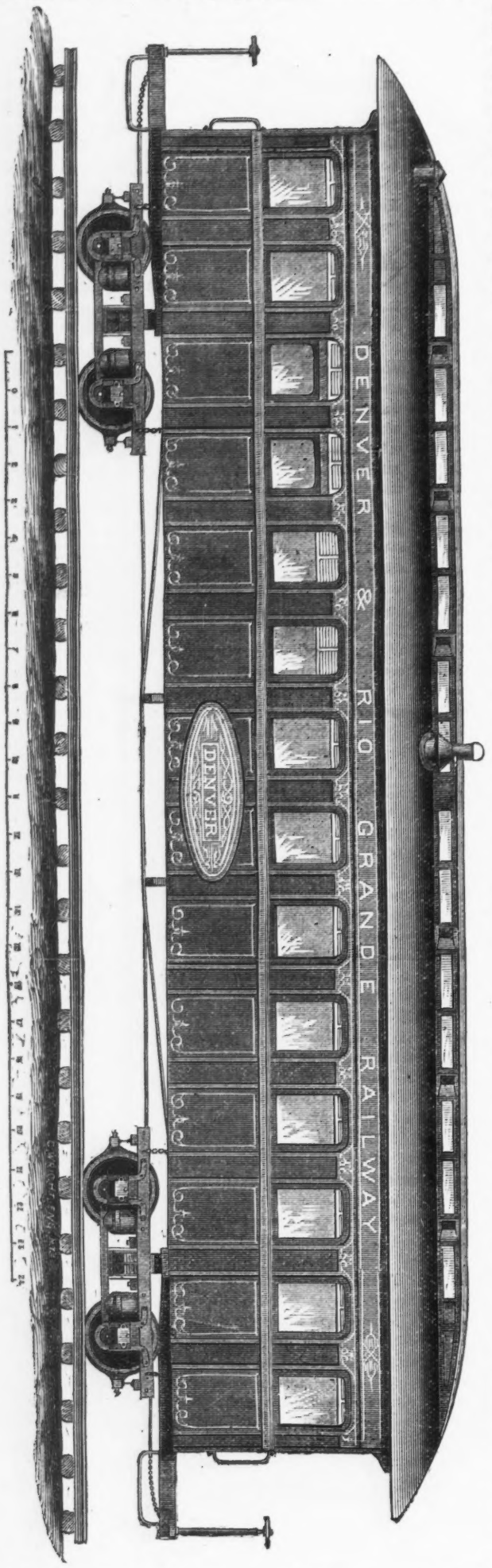
In the latter two the bases are predominant over the silicic acid, therefore they are termed basic slags. Chemists have taken the trouble to establish complicated formulas derived from accurate analysis of various slags; but, as they are rarely constant compounds, these formulas have hardly any practical value for the metallurgist; he is contented to know the percentage of silica and the quantity of the useful metal in them which he is endeavoring to obtain. An experienced smelter must be able to draw his conclusions from the appearance of his slag.

The most desirable form of slag for lead smelting is the singulo-silicate, or a mixture of bi-silicate with the former, with protoxide of iron prevailing. The singulo-silicates run with a bright red color, and solidify very quickly with turgescence.

[TO BE CONTINUED.]

Narrow-Gauge Railroad Cars.

We presented to our readers, a few weeks ago, an illustration of the narrow-gauge passenger train



locomotive, built for the Denver and Rio Grande Railway. This week we give two illustrations of a passenger car of the same line. This car was designed and built at the works of the JACKSON & SHARP Company, Wilmington, Delaware; one of the largest establishments in this country, and the only one, we believe, up to this time, which constructs narrow-gauge passenger and freight cars. The rapidity with which American capitalists have adopted the new style appears in the fact that this company is already filling, or has filled, contracts for such cars with a dozen different roads. On the Denver and Rio Grande, the cars have been running daily since the middle of August, sometimes as high as forty miles per hour, and have withstood even the severest gales of the Colorado plains with perfect success.

As our readers are well aware, we have taken occasion to throw cold water, now and then, upon the extravagant claims and prophesies of the ultra advocates of narrow gauge. This does not prevent us, however, from acknowledging its real merits under suitable conditions; and certainly we have never doubted the feasibility of constructing strong and stable rolling-stock on this plan. If any engineers have entertained doubt on this point, the performance of the cars made by the JACKSON & SHARP Company will satisfy them. Corroborative evidence is furnished by Mr. EDWARD M. GRANT, one of the best engineers in the South, and constructor of the Tuskegee Railroad, in Alabama. Mr. GRANT writes, a fortnight ago:

"We have thoroughly tested your passenger car, built for our three-feet gauge road, and find it a *perfect success*, in every respect. The steadiness and evident stability of the car is the universal subject of comment by all passengers who have passed over the road.

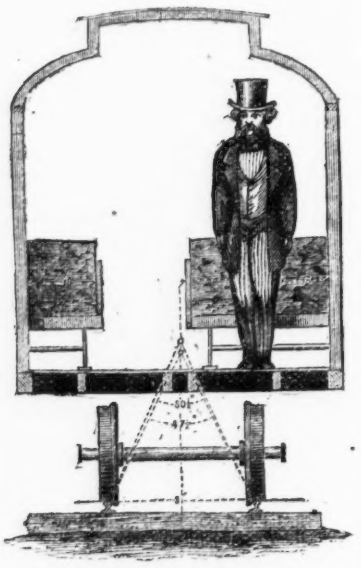
"I have no hesitation in pronouncing it equal, in point of comfort and ease of motion, to any car I ever rode in, even upon the best roads in the Northern States, and consider the successful operation of the three-feet roads as fully demonstrated by the practical test of running our line, since it was opened for business."

It is evident that the American model of passenger cars is the one which can be most successfully adapted to the narrow gauge. The differences between the European styles and this will be recalled by those who have travelled abroad. The long car, the bell-cord, the swinging truck, and the stove, as well as the drawing-room, sleeping, and hotel coaches, and the baggage system, are of American origin; and we think that, in most respects, our plan is superior to the European. The points in which foreigners surpass us, viz., discipline and care for the safety and comfort of passengers, could be easily grafted upon our system.

The American narrow-gauge car, as may be seen from the accompanying illustration, closely resembles the usual model. The specimen here represented is 35 feet long, 7 feet wide, and 10½ feet high. It weighs 15,000 pounds, and carries 36 passengers, being 416 pounds of car for each passenger. The ordinary first-class car, on the other hand, weighing 39,000 pounds, carries but 54 passengers, which is 722 pounds of dead weight per head. The requisite stability is secured by placing the sills only 27 inches, instead of 45 inches, from the ground. This gives an "angle of stability" (as shown in the section) of 50½ degrees for the empty, and 47½ degrees for the loaded car—a remarkably broad base, which leaves no reason for apprehension as to safety under speed.

The interior arrangement may be inferred from the section given. The seats are double on one side and single on the other, this arrangement being reversed in the centre of the car, so that each side carries half double and half single seats—an arrangement which secures a proper balance of weight when the car is full.

Uniformity of gauge in the railways of any country is undoubtedly a desideratum; and if the narrow-gauge is to be generally adopted, its exact width should be fixed by custom or law. The Massachusetts statute prescribes three feet; and this is the general narrow gauge of the United States. Foreign authorities seem to incline to 3 feet 6 inches, apparently on the ground that the requirements of boilers and fire-boxes, especially where wood is the fuel, exclude the narrower gauges. The Queensland railways of Australia, some lines in India, the Toronto, Grey and Bruce, and the Toronto and Nepissing, of Canada, and the government railroads of Norway, all have a three-and-a-half-feet gauge.



We hear no complaints, however, as to boilers and fire-boxes from our American lines; and as to accommodation of passengers, our narrower gauge appears to be fully equal to the other. In fact, a car seven feet wide will accommodate three persons and a gang-way, giving each person 18 inches; and a foot additional width will do no more. According to CHARLES DOUGLAS FOX, the passenger cars on the 3 ft. 6 in. roads are 32 feet long and 8 feet 6 inches wide, and carry but 32 passengers; while, as we have shown, the JACKSON and SHARP car, 35 feet long and 7 feet wide, carries 36. Careful comparisons of prolonged practice between the Canada railways (built by FOX) and our own, must determine permanently which gauge is the best. So far, our American preference seems to be sufficiently well-founded.

The Vice-President of the JACKSON & SHARP Company is Mr. WILLIAM S. AUCHINCLOSS, well known to our profession as the author of the report on Steam Engineering in the U. S. series of reports on the Paris Exposition, and also of the best work hitherto published on the subjects of the slide-valve, cut-off, crank, eccentric, and link motion.

Explosives.

FROM our recent English exchanges we learn that a commission has been appointed by the Government to inquire into the safety and properties of gun cotton dynamite, dualin, lithofracteur, and other explosives.

The appointment of the commission is, doubtless, due to the fearful loss of life at the recent explosion of gun-cotton at Stowmarket. It would be well for us either to profit by the researches of this committee or to appoint one for ourselves to investigate the same subject.

THE COAL TRADE.

B. B. WESTERN, COAL EDITOR.

Anthracite Coals.

NEW YORK, Nov. 9, 1871.

WHOLESALE.—We find the market this week in a very unsettled condition, but stronger than at our last writing. Most of the coal that has been shipped on the market during the past three weeks has been slaughtered and disposed of, and now what little is being received is finding buyers at a fair valuation. Circular rates are being adhered to as close as possible, and Lehigh is being taken readily at our quotations. Of course, there is much more coal being produced than there is any demand for, and it is mostly being piled up at the mines. It has been hoped that the transportation companies would make some reduction in their rates of toll and freight, agreeable to the heavy decline experienced in the market, but as yet we have no notice that anything of the kind has been done. The present prices of coal are not low enough to work off the surplus that is rapidly accumulating, and as the producers cannot put down prices and pay the present rates of transportation, it can plainly be seen that a strike or combination of some kind must come to our relief, otherwise the trade will be excessively dull far into the spring, and unremunerative prices will be the rule. In our opinion, it is best that prices be put down now at the lowest notch. A good trade will then be immediately started, and no surplus will accumulate to hamper us all through the spring. There is no doubt but that we are mining more coal than the country can take at profitable prices, and unless the supply can be cut off, either by a combination of miners working half time, or a combination of transportation companies, agreeing to forward only a certain amount which will keep the market regularly supplied, there will be heavy disasters and failures. If prices rule so low that operators can only work at a loss, the weak ones will give way first, and that will curtail the production in a measure. There is another alternative—a general strike. This has been the means generally used, but as we consider these strikes one of the greatest humbugs of the trade, working no good to any of the parties interested, either miner, operator or transportation company, we trust that wise counsels will prevail, and some means be adopted that will regulate the supply and enable business to proceed in a legitimate manner. Our leading coal operators and transportation companies should immediately call a convention of the most experienced men of their class, and devise some means to help us out of an impending crisis.

Anthracite Coal Trade for 1870 and 1871.

The following table exhibits the quantity of Anthracite Coal passing over the following routes of transportation for the week ending Nov. 4, 1871, compared with week ending Nov. 5, 1870.

COMPANIES.	1870. WEEK.	1870. TOTAL.	1871. WEEK.	1871. TOTAL.
*Phila & Reading R.R.	87,912	2,653 169	96 047	3,342,070
Schuylkill Canal	31,418	455.849	28,236	909,836
Lehigh Valley R. R.	47,671	2,622.023	68,157	1,979,478
Lehigh & Sus. R. R.....	19,716	965.024	37,084	1,062.475
Lehigh Canal	27,420	674.391	30.760	640,174
Scranton North.....	11,412	620.745	20.686	4 9,086
" South	42.080	1,513.280	33,902	991.496
Penn. Coal Co., rail....	22,570	936,142	26.246	621 131
" " " canal..	352	14,944	597	13.238
Del. & Hud. Canal Co..	41,493	1,213,633	35 347	876,314
" " East.....	16,623	392 079	12,556	282,0.5
" " West	128	67,491	3,307	97,188
South.....	10 513	390.8 0	9,900	2.1.219
Shamokin.....	12,931	415,849	16,774	547,213
Trevorton.....	....	67 374	....	....
Lykens Valley Coal Co..	2,262	58,794	2,227	80,642
Wyoming South.....	....	284,330	....	....
Wyoming North.....	....	....	....	4,167
P. N. Y. C. & R R. Co.	5,119	257.561	....	104,987
Williamstown Coll'y....	7,105	2.5,183	....	....
Big Lick Col...	2,881	77,973	3,120	125,865
Total.....	393,646	13.850 852	431.0 6	12,441,407
1870.....		12,407.497	393,946	
Decrease.....		1,452,445		
Increase				41,380

* Less coal transported for Co's use and Bituminous coal.

Bituminous Coal Trade, 1870 and 1871.

The following table exhibits the quantity of Bituminous Coal passing over the following routes of Transportation for the week ending Nov. 4, 1871, compared with week ending Nov. 5, 1870.

COMPANIES.	1870. Week.	1870. Year.	1871. Week.	1871. Year.
C. & O. Canal.....	17,630	459,5.9	15,373	593,793
B. & O. R. R.....	21,012	728.2.9	26 141	1,047,761
H. & B. T. R. R.....	6 252	262 974	6,745	272,292
Harrisburg & D.....	14,429	638,720	17,950	680,291
*L. V. R. R.....	....	12.213	7,716	341,780
P. & N.Y.C. & R. Co.....	5,232	223,220	....	....
Cumberl'd Branch Canal	1,9 4	78 260	4,814	175,252
" Railroad....	3,049	102,239	1,679	60,123
Total.....	69,559	2 525,414	80,448	3,176,209
			69,559	2,525,414
Increase.			10,889	650,795

The tonnage of the P. & N. Y. C. & R. R. Co. is included in that of the L. V. R.R. Co

Philadelphia & Reading Railroad and Branches.

COAL TONNAGE

For the Week ending Saturday, November 4, 1871.
BY RAILROAD—ANTHRACITE.
PASSING OVER MAIN LINE AND LEB. VAL. BRANCH.

	Tons.	Cwt.
From St. Clair.	37.606	01
" Port Carbon.	7,006	01
" Pottsville.	1,533	11
" Schuylkill Haven.	24,877	14
" Pine Grove.	7,320	04
" Tamaqua.	13,982	11
" Harrisburg.	23	03
" Dauphin.	5,668	09
Total	98,017	14

FOR SHIPMENT BY CANAL.

Passing Frackville Scales	9,275	04
" Mill Creek "	1,611	13
" Schuylkill Valley Scales	2,779	14
" Mt. Carbon "	814	19
" Cressona "	8,328	07
" Pine Grove "		
" Tamaqua "	2,695	01
Total	25,504	18

SHIPPED WESTWARD VIA NORTHERN CENTRAL RAILROAD.

Passing Locust Gap.	1.593	11
" Shamokin.	3,959	15
" Herndon.		
Total	5,553	06

SHIPPED WEST OR SOUTH FROM PINE GROVE.

Via Schuylkill & Susquehanna R. R.	1,307	00
" Lebanon & Pine Grove Branch	1,646	15
Total	2,953	15

CONSUMED ON LATERALS.

From Frackville Scales.	698	05
" Mill Creek "	658	13
" Schuylkill Valley Scales.	287	08
" Mt. Carbon "	816	12
" Cressona "	384	09
" Pine Grove "	525	15
" Tamaqua "	341	18
Total	3,713	00

LEHIGH AND WYOMING COAL.

Received via Allentown, E. Penn'a Br.	168	04
" " Alburtis, "	35	16
" " Oreland, G. & N. Br.	830	02
" " Connecting R. R.		
" " Willow Street R. R.	282	04
Total	1,316	06

BITUMINOUS.

From Harrisburg.	12.257	15
" Connecting R. R., G. & N. Br.		
" Junction R. R.	192	02
Total	12,449	17

COAL FOR COMPANY'S USE.

Anthracite	4 550	05
Bituminous	340	04
Total.	4,890	09

RECAPITULATION

	Total for Week.	Corresponding week last Year.	
Passing over Main Line and Leb. Val. Branch	98 017 14	93,996 18	i 4,020 16
For Shipment by Canal	25,504 18	25,525 09	d 20 11
Shipped Westward via Northern Central R. R.	5,553 06	6,396 03	d 842 17
Shipped West or South from Pine Grove	2,953 15	1,159 10	i 1,794 05
Consumed on Laterals	3,713 00	3,614 13	i 98 07
Lehigh and Wyoming Coal	1,316 06	319 08	i 996 18
Total Anthracite paying fr'gt	137,058 19	131,012 01	i 6,046 18
Bituminous	12,449 17	8,831 18	i 3,617 19
Total of all kinds paying fr'gt	149,508 16	139,843 19	i 9,664 17
Coal for Company's use	4,890 09	3,881 03	i 1,009 06
Total Tonnage for Week	154,399 05	143,725 02	i 10.674 03
Since Dec. 1, 1870	5,270213 15	4012405 19	i 1257807 16
Total to date	5.42461300	4155131 01	i 1269481 19

SHIPPED BY CANAL.

	Total for Week.	Corresponding week last Year.	
From Schuylkill Haven	24,383 03	28,768 15	d 3 385 06
" Port Clinton	2,853 00	1.14 00	i 1,839 00
Total Tonnage per Week	28 236 09	29.782 15	d 1.546 06
Since Dec. 1, 1870	881,599 07	431.214 11	i 450384 19
To'al to date	909 835 16	460,997 06	i 448838 16

Report of Coal Transported over Central R.R. of N. J. (Lehigh and Sus. Div.)

Week ending Nov 4—Compared with same time last year.

WHERE SHIPPED FROM	WEEK 1871., tons ct	WEEK 1870. tons ct.	YEAR 1871 tons cwt.	YEAR 1870. tons. cwt
Wyoming Region	33177 01	25197 18	1082901 08	1053264 09
Upper Lehigh Region	4443 12	2731 11	82.39 06	12e945 04
Beaver Meadow Region				
Hazleton Region :	9532 02	7369 12	181750 07	277531 01
Mahanoy Region				
Freeskow Region	3695 06		63194 15	
Mauch Chunk Region	7918 00	5238 19	183230 18	97656 16
Totals	58726 01	40829 09	1595476 14	1557477 10
Increase	17897 01		37999 04	
Decrease				
DISTRIBUTION.				
Forwarded East of Mch Chunk by Rail	37083 16	19715 15	1062277 16	865030 15
Forwarded East of Mch Chunk by Canal	16964 09	14690 17	365435 18	461852 19
Delivered at and above Mauch Chunk	1843 13	1159 01	56335 16	38124 03
Delivered to L. & B. R. R.at Plymouth Bridge	3196 10	4925 07	84430 09	170338 18
L. V. R. R at Packer'n	538 02	338 00	26065 15	21540 15
Totals	59726 01	40929 09	1595476 14	1557477 10
Of the above there was transported on acc'n of L. C. & I. Co.	12278 08	7593 01	473974 18	133990 13
W.-B. C. & I. Co.	20071 14	19437 10	725478 19	516162 10
Totals	32350 00	12415 01	999453 17	652153 03
Increase	12341 18	20008 02	347300 14	
Decrease				

Schuylkill Canal.

Report of coal transported over the Schuylkill Canal for the week ending Saturday, Nov. 4, 1871.

	Tons.	Cwt.
rom Port Carbon		
" Pottsville		
" Schuylkill Haven	25,383	03
" Port Clinton	2,853	00
Total for week	28,236	09
Previously this year	881,599	07
Total	909,835	16
To same time last year	455,849	08

Report of Coal Transported over Lehigh Valley Railroad

Report of coal tonnage for week ending Nov. 4, 1871, previously this season, compared with same time last year:

WHERE SHIPPED FROM.	WEEK. Tons. Cwt.	TOTAL. Tons. Cwt
Total Wyoming	16,212 18	516,051 13
" Hazleton	43,319 08	1,161,480 12
" Upper Lehigh	177 13	2.074 08
" Beaver Meadow	16,212 13	420,206 05
" Mahanoy	10,570 17	460.111 02
" Mauch Chunk	221 06	7,641 00
" Sullivan & Erie	713 05	5,936 00
Total Anthracite	92.428 00	2,573,501 00
Bituminous Coal from all sources	7.715 15	341,780 07
Total by rail and canal	100,143 15	2,915,281 07
Same time last year	66,599 14	3,361,746 18
Increase	33,554 01	
Decrease		446,465 11
Forwarded East from Mauch Chunk by rail	68,156 17	1,979,477 16
Same time last year	47,671 11	2,622,022 17
Increase	20,485 06	
Decrease		642,545 10

RECAPITULATION.

Forwarded East from Mauch Chunk by rail	68,156 17	1,979,477 16
To N. C. R. R., at Mount Carmel		4,290 06
Forwarded North from L. & B. Junction	9.809 14	276,987 00
To L. & S. R. R. at Packerton for rail	250 04	6,283 07
Delivered at M'h Chunk	35 14	1,186 16
Delivered on line of road above Mauch Chunk	497 04	10,646 17
Delivered above Mauch Chunk for use of L. V. R. R.	1,405 15	45,767 19
To L. & S. R. R., at Penn Hav., for railroad		94 10
Do. for canal	9,093 16	181,849 03
At M. Chunk for canal	3,178 16	66,912 06
Total Anthracite	92,428 00	2,573,501 00
Bituminous Coal	7,715 15	341,780 07
Total all kinds	100,143 15	2,915,281 07

This report includes all Bituminous Coal carried over the Lehigh Valley and P. & N. Y. Railroads from December 1st, 1870, to date.

Pennsylvania Coal Company.

Shipments of Pittston Coal for the week ending Nov. 4, 1871.

	1871. WEEK.	1871. YEAR.	1870. WEEK.	1870. YEAR.
By Railway	26,246 07	621,131 12	22,570 07	961.141 17
" Canal	597 05	13,238 11	361 14	14,943 13
Total	26.843 12	634,370 03	22,932 01	996,085 10
Decrease 1871, 361,715 07				

Lehigh Coal and Navigation Company,

Report of Coal transported over the Lehigh Canal and L. & S. Div. of Central Railroad of New Jersey for the week ending Nov. 4, 1871, and for the year 1871.

	WEEK.	YEAR.
Forwarded East of Mauch Chunk by Rail	37,083	1,062,277
Delivered at and above do.,	1,843	56,335
Forwarded East of do., by Canal	30,760	640.173
	69,687	1,758,787
Corresponding period last year—		
Forwarded East of Mauch Chunk by Rail	19,715	865,020
Delivered at and above do.,	1,159	38,1 4
Forwarded East of do., by Canal	27,419	674,391
	48,294	1,577,536
Increase on Railroad	18,052	215,468
Decrease " "		
Increase on Canal	3,340	
Decrease " "		34,217
Of the above there was transported on account of—		
Lehigh Coal Nav. Co	22,695	504.789
Wilkesbarre Coal & Iron Co	20,071	725,478
	42,766	1,230,268
Corresponding period last year—		
Lehigh Coal Nav. Co	13,858	219.102
Wilkesbarre Coal & Iron Co	12,415	516,162
	26,273	735,264
Increase	16,493	495,003

Delaware and Hudson Canal Company.

The following is a statement of Coal Transported by the Delaware and Hudson Canal Co. for the week ending Nov. 4 1871.

	FOR THE WEEK.	FOR THE SEASON.
By Delaware and Hudson Canal	35,347	876,314
By Railroad, East	12,756	282,025
" " West	3,307	97,188
" " South	9,960	271 219
Total Tons	61,110	1,526,746

For the same period last year.

	FOR THE WEEK.	FOR THE SEASON
By Delaware and Hudson Canal	41,493	1,213.633
By Railroad, East	16,623	362.079
" " West	128	67,691
" " South	10,513	390,830
Total Tons	68,757	2,034
Decrease	507,487	

Philadelphia and Reading R. R.

Amount of coal transported on the Philadelphia and Reading Railroad during the week ending Saturday, Nov. 4, 1871:

	tons.	cwt.
From St. Clair	37,606	01
" Port Carbon	7,096	01
" Pottsville	1,533	11
" Schuylkill Haven	24,877	14
" Auburn	10,827	07
" Port Clinton	13,962	11
" Allentown and Alburtis	204	00
" Harrisburgh and Dauphin	17,950	07
Total paying freight	113,987	12
Coal for Company's use	4,890	04
Total for week	118,877	16
Previously this year	3,975,747	09
Total	4,094,625	05
To same time last year	3,382,992	06

Delaware Lackawanna & Western Rail Road Company.

Coal transported on the Delaware, Lackawanna and Western R. R. for week ending Nov. 4, 1871.

	Week. Tons.	Cwt.	Year. Tons.	Cwt.
Shipped North	20,685	16	458,086	05
Shipped South	39,992	06	991,496	07
Total	60,678	02	1,449,582	12
For the corresponding time last year:				
Shipped North	11,412	07	625,744	13
Shipped South	42,079	16	1,513,279	11
Total	53,492	03	2,139,024	04
Increase	7,185	19		
Decrease			689,441	12

Delaware and Hudson Canal Company.

Coal mined and forwarded by the Delaware and Hudson Canal Company for the week ending Saturday, Nov. 4, 1871.

	WEEK.		SEASON.	
North	56,218	09	1,278,371	10
South	9,899	17	271,219	08
Total	66,118	06	1549,590	18
Corresponding time in 1870:				
North	47,303	12	1,798,493	05
South	10,513	16	390,830	09
Total	57,817	08	2,189,323	14
Increase North	8,914	17		
Decrease North			520.121	15
Decrease South	613	19	119,611	01
Total increase 1871	8,300	18		
Total decrease 1871			639,732	16

Statement of Coal Transported over Cumberland and Pennsylvania Railroad

During the week ending Saturday Oct. 28, and during the year 1871, compared with the corresponding period of 1870.

WEEK.

	To C.& O. Canal Tons.	Cwt.	To B.&O. R.R. C. Tons.	Cwt	Total. Tons	Cwt.
1871	15,373	01	25,140	18	41,513	19
1870	17,680	08	21,013	06	38,693	14
Increase			5,127	12	2,820	05
Decrease	2,307	07				

YEAR.

1871	598,799	09	1,047,761	12	1,646,561	01
1870	459,528	19	728,209	01	1,187,738	09
Increase	139,270	10	319,552	02	458,822	12
Decrease						

Cumberland Branch

WEEK.

	To C. & O. Canal. Tons.	Cwt.	To B.&O.R.R. Co Tons	Cwt.	Total. Tons	Cwt.
1871	4,843	13	1,678	18	6,522	11
1870	2,904	08	3,049	09	4,953	17
Increase	2,939	05			1.568	14
Decrease			1,370	11		

YEAR.

1871	175,251	14	60,123	05	235,374	19
1870	78,260	05	102,189	09	180,449	14
Increase	96,991	09			54,925	05
Decrease			42,0	66		

Huntington and Broad Top R. R. Co.

For week ending Nov. 4, 1871	6,745	tons.
Same time last year	6,252	"
Increase	493	
Decrease	....	"
Total amount shipped to date	272,292	"
Same time last year	262,974	"
Increase	9,313	"
Decrease		

Shamokin Coal Trade.

For week ending November 4, 1871	16,773 14
Same time last year	12 930 19
Increase	3,842 15
Decrease	
Total amount shipped to date	547,212 13
Same time last year	415,848 18
Increase	131,363 15
Decrease	

Company Coals.

Nov, 1871.

	L.	Str.	Gra	Eg.	Sto.	Chest
*Scranton at E. Port	—	—	—	—	—	—
*Pittston at Newburgh	5 10	5 10	5 30	5 40	5 80	5 10
*Lackawana at Rond't	5 10	5 10	5 30	5 60	5 95	5 10
Wilk'b're at Hoboken	4 00	4 25	5 00	5 00	6 00	4 75
Old Co. Lehigh at Pt John'n	5 75	—	5 75	5 75	6 25	5 50
Lehigh at Eliz. Port	5 75	—	5 75	5 75	6 25	5 50

For freights to different points see "Freights."

* To contractors.
* None to sell.

Line Prices for Coal Nov, 1871,

	Lump	Broken	Egg	Stove	Ches'.
At Mauch Chunk	4.00	4.00	4.00	4.25	3.00
" Wilkesbarre	3 75	3.75	3.75	4.00	3.00

Prices of Coal by the Cargo.

[CORRECTED WEEKLY.]

	AT NEW YORK, Nov. 1. R.	A.	W.	A.	AT PHILADELPHIA. Nov. 1. R.	A.	W.	A.
SCHUYLKILL.								
Lump	$—	—	$—	—	—	—		
Steamer	4 80		—	—	—	—	4 50	
Broken	4 80		—	—	—	—		
Egg	—	—	—	—	5 00	—	4 75	
Stove	6 25	—	—		5 00	—	5 00	
Chestnut	5.00	—	—		—	—		
Pea	—	—	—		—		—	—
LEHIGH.								
Lump, (along side)	6 25		—		—		—	
Broken	6 25		—		—		—	
Egg	6 25		—		—		—	
Stove	6 25		—		—		—	
Chestnut	5 25		—		—		—	
Pea	—	—	—		—		—	
SPECIAL COALS.*								
Diamond Vein	R. A.	6 00@6 25			—	—	—	
New England	"		—		—	—	—	
Locust Mountain	W. A.	6 50			—	—	—	
Honey Brook, Le'h	W. A.	5 50@6 25			—	—	—	
Spring Mountain	" "	5 50@6 25			—	—	—	
Sugar Creek	" "	5 50@6 25			—	—	—	
Sugar Loaf	" "	5 50@6 25			—	—	—	
Old Comp'y's.	" "	5 50@6 25			—	—	—	
Cross Creek	" "	5 50@6 25			—	—	—	
Room Run	" "	5 50@6 25			—	—	—	
Girardville	" "	—			—	—	—	
McMichael	" "	—			—	—	—	
Shamokin	" "	5 25			—	—	—	
Lykens Valley	" "	5 75			—	—	—	
Broad Top	" "	5 25			—	—	—	
Hill & Harris	" "	—			—	—	—	
Henry Clay	" "	—			—	—	—	
Powelton	" "	5 25			—	—	—	

* Dealers in these coals may be found in our advertising columns

Prices at Baltimore—Nov, 1871.

Wholesale Prices to Trade.

Wilkesbarre, by cargo or car load	$5 60@5 85
Pittston and Plymouth, do	— —@5 60
Shamokin Red or White Ash, do	— —@5 60
Lykens Valley Red Ash, do	— —@6 30
Zerba Valley	— —@— —
Trevroton	— —@— —
By retail, all kinds per ton of 2240 lbs.	7 00@8 25
Georges Creek & Cumberland f. o. b. at Locust Point for cargoes	— —@4 75
Fairmount and Clarksburg gas, f. c. b. at L. Point	6 00@6 50
BITUMINOUS COALS.	
Kittaning Coal Co.'s Phœnix Vein..f.o.b. at Phila	$ —
Lemon " " "	—
Cumberland Vein Coal	—
Consolidation Coal Co.'s on board N. Y.	6 75
Maryland Coal Co. " "	6 75

Prices at Georget'n, D.C., & Alexandria, Va.

Nov, 1871.

George's Creek and Cumberland f. o. b. for shipping...$4 35@4 05

Prices at Havre de Grace, Md.

Wilkesbarre and other White Ash for cargoes	$5 25@ 5 50
Lykens Valley	6 25@ 6 50
Shamokin Red or White Ash	5 50@ 5 75
Trevorton and Zerba Valley	— —@—

Prices of Gas Coals.

Nov, 1871.

PROVINCIAL.

Corrected weekly by Louis J. Belloni, Jr., 41-43 Pine st., N.Y

Duty, $1 25, gold	Coarse	Slack.
Block House	$1 75 @-1 75	
Gowrie	1 75 @-1 75	

Corrected by Bird, Perkins & Job, 86 South street.

	Coarse.	Culm of Coal
Pictou	$2 25	@1 25
Sydney	2 25	@- 80
Lingan	1 60	@- 80
Little Glace Bay	1 60	@1 00
Caledonia	1 60	@- 80

A discount from the prices of the coarse Coal on purchase of 5000 tons and upwards. Duty $1 25 per ton, gold, on the coarse coal. 25 per cent. ad valorem on the Culm of Coal.

AMERICAN.

	Currency.
Westmoreland	$7 00 @- —
Fairmount Gas Coal Co. of N. Y.	7 00 @- —
Dusgard Coal Co	7 00 @- —
Penn	7 00 @- —
Newburg Orrel Gas	— —@- —
West Fairmount Gas Coal	7 00 @- —
AT PHILADELPHIA.	
Powelton	$6 75
TO NEW YORK.	
Provincial.	
Sidney	$3 25
Lingan	3 25
Cow Bay	3 37½
Port Caledonia	3 37½
Little Glace Bay	3 25

Prices of Foreign Coals.

Oct, 1871.

Duty $1 25 per ton.

Corrected weekly by PARMELE BROS., No 32 Pine street, N. Y.

Liverpool Gas Caking	$ 8 00@— —
" " Cannel	10 50@12 00
" House "	— —@16 00
" Orrel	12 00@14 00

Per ton 2,240 lbs., ex-ship.

PRICES FROM YARD.

Liverpool House Orrel, screened	$16 00@17 50
"Cannel, "	18 00@20 00

Per ton 2,000 lbs. delivered.

Rates of Transportation to Tide Water.

BY RAILROAD.

TO PORT RICHMOND, PHILADELPHIA.

Philadelphia and Reading Railroad, from Schuylkill Haven for consumption	$2 10
For reshipment	2 00

MAUCH CHUNK TO ELIZABETHPORT.

L. V. Railroad from Mauch Chunk to Phillipsburgh	$0 92
C. R. R., N. J., Phillipsburgh to Elizabethport	1 88
Shipping expenses at Elizabethport	25
Wharfage	10
Total	$2 15

MAUCH CHUNK TO PORT JOHNSON.

L. V. R.R., or L. & S. R.R. from M. C. to Phillipsb'g	$0 92
C. R. R., of N. J., Phillipsburgh to Pt. Johnson	1 88
Shipping expenses	25
Wharfage	10
Total	$2 15

TO HOBOKEN.

L. V. R. R., Mauch Chunk to Phillipsburgh	$ 92
Morris & Essex R. R. Phillipsburgh to Hoboken	1 88
Shipping expenses	20
Wharfage	15
Total	$2 15

TO SOUTH AMBOY.

L. V. R. R.	92
B. & D. R. R. / Cam. & Am. R. R.	1 81
Shipping Expenses	35
Total	$2 08

PENN HAVEN TO ELIZABETHPORT.

L. V. R R. Penn Haven to Phillipsburgh	90
C. RR. of N. J. Phillipsburgh to Elizabethport	128
Shipping expenses	25
Wharfage	10
Total	$ 2 51

BY CANAL.

Via Schuylkill Canal.

TO PHILADELPHIA.

From Schuylkill Haven	Toll..$1.35	Freight..95c....	$2 30
" Port Carbon			....
" Port Clinton	" 1.88	" 55c....	2 23

Drawback 15 cents during August.

NEW YORK.

From Schuylkil Haven	Toll..1 10	Freight..$2 00..	$3 10

The Rates of Toll on Lump and Steamer Coal will be ten per cent less than the above rates. The charge will be per ton of 2240 lbs. No charge less than Forty Cents per ton will be made for any distance. A drawback of thirty cents is allowed on all coal passing Fairmount Locks used at Philadelphia and vicinity.

Via Lehigh Canal.

TO PHILADELPHIA

Lehigh Canal	$ 80
Freight and towage	1 10
Total	$1 90

TO NEW YORK.

Lehigh Canal	$1 57
Morris Canal / Freight / Towing	208
Total	$2 6

TO JERSEY CITY.

Lehigh Canal	$ 44
Morris Canal / Freight	2 06
For re-shipment	2 00

Via Delaware and Raritan Canal.

TO NEW YORK.

Lehigh Canal	$ 57
Delaware Division Canal	38
Delaware and Raritan Canal	
Freight	1 25
Towage	20
Total	$2 6

Freights.—Oct, 1871.

TO EASTERN PORTS.	Cumberland. From Georgetown.	From Baltimore.	Anthracite. From Philada.	From East Port, Port Johnston, and Hoboken.	From Newburg...	From Rondout...
Amesbury			$2 50	$1 95		
Bangor	$2 75		2 25	1 70		
Bath	2 75	2 65	2 35	— —		
Boston	2 60	2 60	2 25	1 85	180	1 85
Bridgeport	2 25	2 30		1 10	1 10	1 25
Bristol		2 60		1 50		1 .0
Cambridgeport			2 35	1 85		
Derby				1 25		
Dighton	2 30	2 35		— —		
East Cambridge				1 85		
Fall River	2 25	2 30		1 40	1 40	
Hackensack				—		
Hartford	2 75	3 00	2 40	1 50		
Jersey City		2 00		80	70	
Middletown				1 25		
Mystic			— —	1 25		
New Bedford	2 50	2 35	2 00	1 40		
Newburyport	2 75			1 90		
New Haven	2 25	2 30		1 15	1 10	
New London	2 25	2 30	1 95	1 25		
Newport				1 40		
New York	2 00	1 90	1 40	75	70	
Norwalk		2 30		1 10	1 10	
Norwich	2 25	2 30		1 20	1 40	
Pawtucket	2 50	2 50	2 15	1 20		
Portland	2 50	2 60	2 40	1 70		
Portsmouth, N.H	2 75	2 75		2 00		
Providence	2 25	2 30	2 00	1 40	1 50	
Rockport						
Saco	2 75		2 65	— —		
Sag Harbor				1 20		
Salem	2 60	2 65	2 25	1 80		
Stamford				1 10	1 10	
Stonington				1 25	1 20	
Taunton				1 80		
Warren			— —	1 40		
Washington			1 25			
TO RIVER PORTS.						
Albany		80			55	
Catskill		70			50	
Cocksackie		70			50	
Coeyman's		70			65	
Cold Spring	2 20	70			30	
Fishkill		70	1 60		30	
Haverstraw					60	
Hudson	2 20	2 25			40	
New York					60	
Nyack			1 75		30	
Poughkeepsie					30	
Rhinebeck						
Rondout					75	
Saugerties			1 60		40	
Sing Sing					75	
Stuyvesant					75	
Tarrytown					75	
Troy					55	
West Point			1 75			
Yonkers					60	

MARKET REVIEW.

FOR THE WEEK ENDING NOV. 11, 1871.

IRON.—The market for Scotch Pig, though quiet, is firm at the recent advance. The stock is light, and composed chiefly of Eglinton, 400 tons of which sold at a private price. In other brands, we have only to notice 50 tons Coltness at $34 50, gold. Glengarnock is held at $35@36, and Gartsherrie $38@39. In American, we hear of no business, but prices are firm at $37@38 for No. 1, and $35@36 for No. 2 ex. Rails, both old and new, remain quiet. 25 packs stained Russia Sheet sold at 12¾ cents, gold.

LEAD.—Pig remains very quiet; ordinary Foreign may be quoted $5 90@6, and Refined and selected brands $6 25, gold. The receipts for November were 500 tons, against receipts of 2500 tons in October. Bar, 9¼ cents; Sheet and Pipe, 10¼, and Tin-lined Pipe, 15, less 10 per cent. to the Trade.

COPPER.—The manufactures of Copper and Yellow Metal are steady at our quotations. The demand for Ingot is still very limited, though prices are without quotable change. The sales embrace about 150,000 lbs. Lake at 23¼@23¾ cents, cash.

SPELTER.—Cable accounts are at hand noting an advance in the European market, and prices here have been advanced ¼@½ cent per lb. There has been considerable business, and sales have been made of 25 tons best Silesian at 6½ cents, 25 do. medium grade 6¼, and 50 do. Stolberg 6 3-16, all gold. We quote at the close best brands Silesian at 6¼ cents, gold, medium 6¼, common 6¼, and Stolberg 6 3-16.

TIN.—The recent shrinkage in prices of Pig, together with more favorable European accounts, has brought forward buyers, and there has been a considerable movement, with prices favoring sellers again, the purchases embracing 4000 slabs Straits, on the spot and to arrive, on private terms; part, however, at 35½@35¾ cents; and 25 tons English L. & F., mostly at 34¼. Banca firm at 41 @41½; for Straits 36 cents is bid, and 36½ asked; English L. & F. held at 35¼, all gold. By cable, we learn that the London market has been active at £140 10s. for English L. & F. Plates have been quiet, but prices remain steady and quite firm; sales have been made of 500 bxs. Charcoal Tin at $8 81 for I. C., and 500 do. Charcoal Terne, $8@8 12½, gold.

We make the following extract from the monthly circular of 31st ult. of Messrs. WHITE & HASKELL: "The importations for October were 16,342 slabs Straits or 656 tons, and 110 tons English L. & F. From the East Indies, 10,500 slabs Straits or 422 tons, are on the way, and due in all November, December and January. Stock in importers' and speculators' hands, Billiton 1100 slabs or 34 tons, Straits none, English L. & F. none, and Banca none. Total New York and Boston, 1100 slabs or 34 tons, against 8100 slabs or 316 tons in 1870, 6400 slabs or 257 tons in 1869, and 10,825 slabs or 435 tons in 1868."

Zinc Sheet. Foreign, 10c., gold; Manganese black oxide, 3½c., gold; Manganese Pyrolusite, 5½c., gold.

The following is from the metal circular of Messrs. VIVIAN, YOUNGER & BOND, dated London, Oct. 20, 1871:

The general trade in Metals has been small, but prices have been well maintained, and where any alteration in values has taken place, it has been towards higher rates.

Copper.—We have to report about 850 tons of Chili Bars at from £67 for Lota, up to £68 for good ordinary, and £69 for best brands. At the Swansea Ticketing on 17th inst., 2353 tons of Ores, average produce 16 per cent., were sold at an average of 13s. 5½d. per unit. Otherwise no transactions in Furnace Stuff have been reported. Neither English sorts nor fine foreign Copper have been in very active request, the views of buyers and sellers being too wide apart to admit of much business. At the close the tone is a trifle firmer than it was early in the week.

Tin.—Straits Tin continued dull of sale at slightly declining prices up to mid-day yesterday, when some large speculative buying suddenly commenced, driving the price up 50s. per ton, and we close at the nominal price of 137s. 6d. for cash, and 137s. to arrive. In Banca and English nothing has occurred worth reporting, trifling sales having taken place at our quotations.

Tin Plates.—The demand has been good, and the continually advancing prices of Iron and Tin naturally induces makers to be very firm in their quotations, and even unwilling to engage themselves at all for very far ahead.

Iron.—There is a large inquiry, but buyers are scarcely prepared to pay the extreme quotations now asked.

Spelter.—The business doing has been on a larger scale than for a long time past, and prices are 10s. higher closing with a very firm appearance.

Lead.—Rates are unchanged, but orders are scarce.

METALS.

NEW YORK, Nov. 11, 1871.

IRON.—Duty: Bars, 1 to 1¼ cents ₱ lb; Railroad, 70 cents ₱ 100 lbs.; Boiler and Plate, 1½ cents ₱ lb; Sheet, Band, Hoop, and Scroll, 1¼ to 1¾ cents ₱ lb; Pig, $7 ₱ ton; Polished Sheet, 3 cts. ₱ lb; Galvanized 2½; Scrap Cast, $6; Wrought, $8 per ton.

	Store Prices
Pig, Scotch No. 1, ₱ ton	34 00@40 00
Pig, American, No. 1	37 00@38 00
Pig, American, No. 2	35 00@36 00
Pig, American, Forge	33 00@34 00
Bar Refined, English and American	80 00@— —
Bar Swedes, assorted sizes (gold)	85 00@100 00
	Store Prices, Cash.
Bar, Swedes	107 50@120
Bar, Refined, ord'y sizes	85 00@— —
Bar, Refined, 1¼ to 6 by ¼ @ 5-16 inch	— —@ 90 00
Bar, Refined, 1 & 1½ by ¼ & 5-16	— —@ 92 50
Bar, Refined, 2½ to 3 Round & Square	— —@ 92 50
Scroll	102 50@132 50
Ovals and half-round	102 50@122 50
Band	— —@ 97 50
Horse Shoe	100 00@105 00
Rods, ⅜ to 3-16 inch	90 00@125 00
Hoop	107 50@150 00
Nail rod	6¾@— —
Sheet, Russia, as to assortment (gold)	17½@18
Sheet, Single, D. and T. Common	—4¾@— 5¾
Sheet, D. and T. Charcoal	—5¼@—6¼
Sheet, Galv'd, Nos. 14 to 26	27½ to 30 ct. dis. 12@14c ₱ lb
" " Nos. 27, 28, and 29	27½ to 30 ct. dis. 15@18c ₱ lb
Rails, English (gold), ₱ ton	57 00 @59 00
Rails, American, at Works in Pa	70 00 @71 00

STEEL.—Duty: Bars and ingots, valued at 7 cents ₱ lb or under, 2¼ cents; over 7 cents and not above 11, 3 cents ₱ lb; over 11 cents, 3½ cents ₱ lb, and 10 ₱ cent ad val. (Store prices.)

English Cast (2d and 1st quality) ₱ lb	— 15 @— 18
English Spring (2d and 1st quality)	— 7 @— 10
English Blister (2d and 1st quality)	— 10 @— 17
English Machinery	— 11 @— 13
English German (2d and 1st quality)	— 10½@— 12
American Blister "Black Diamond"	— — @— 12
American, Cast, Tool do.	— 15 @— 16
American, Spring, do.	— 9 @— 11
American Machinery, do.	— 9 @— 10
American German, do.	— 9 @— 11

COPPER.—Duty: Pig, Bar, and Ingot, 5; old Copper 4 cents ₱ lb; Manufactured, 45 per cent. ad val.

	All Cash.
Copper, New Sheathing, ₱ lb	— @— 32
Copper Bolts	— @— 34
Copper Braziers, 16oz. and over	— @— 34
Copper Nails	— @— 39
Copper, Old Sheathing, &c. mixed lots	20 @— 21
Copper, Old, for chemical purposes, 14@16 oz	23½@— —
Copper, American Ingot	23¾@— —
Yellow Metal, New Sheathing & Bronze	— @— —
Yellow Metal Bolts	25 @— —
Yellow Metal Nails	— @— 24

SPELTER—Duty: In Pigs, Bars & Plates, $1.50 p. 100 lb

Plates, Foreign (gold) p. 100 lb.	6 12½@ 6 50
Plates, Domestic p. lb.	— 7 @— 11

LEAD.—Duty: Pig, $2 ₱ 100 lbs.; old Lead, 1½ cents ₱ lb; Pipe and Sheet, 2½ cents ₱ lb.

Galena, ₱ 100 lbs	$— — @— —
Spanish (gold)	5 90 @6 00
German, do.	5 90 @6 00
English do.	6 15 @6 50
Bar (net)	9 25 @— —
Pipe (net)	— — @10 25
Sheet	— — @10 25

Colwell, Shaw & Willard Tin-Lined Lead Pipe 15 cts. ₱ lb.

TIN.—Duty: Pig, Bars, and Blocks, 15 ₱ cent. ad val.; Plate and Sheets and Terne Plates, 25 ₱ cent.; Roofing 25. ad val.

	Gold ₱ lb.
Banca	41 @41¼
Straits	36 @36⅝
English	35 @35¼

PLATES.

Fair to Good Brands.	*Gold.*	*Currency.*
I. C. Charcoal, ₱ box	$8 75 @9 00	$10 25 @10 75
I.C. Coke	7 50 @8 50	9 00 @10 00
Coke Terne	6 37½@7 50	7 25 @ 9 00
Charcoal Terne	7 75 @8 25	9 50 @10 00

ZINC—Duty: Pig or Block, $1 50 ₱ 100 lb.; Sheet, 2½cts. ₱ lb.

Sheet, No. 9 Foreign ₱ lb.	— @— — 9½ @ 10

The San Francisco stock market has decidedly improved. According to the following report, dated the 7th inst., the only exception to a general advance of the list is a slight decline of Yellow Jacket and Gould & Curry, neither one of which items seems to have recovered from the depreciation caused by the recent failures. Belcher and Kentuck again form the exception to the average tendency of the list, each one of which have notably advanced, compared with our last report. Savage is higher than for a long time past, being placed on the list at $48½. Eureka G. V. evinces a gradual improvement. Raymond & Ely remains at 100 and thereabouts.

San Francisco Stock Market.

Savage	48¼
Yellow Jacket	54
Kentuck	150
Chollar Potosi	31
Gould & Curry	104
Belcher	310
Crown Point	300
Raymond & Ely	...
Imperial	No Sales.
Imador	270
Eureka G. V.	19½

Mining Stocks.

The only transactions in gold stocks which have occurred during the past week are sales of 100 shares of Bates & Baxter at 25, and 500 Grass Valley at 6 S. 3; yet in face of these limited operations, a more decided improvement in the market is manifested than has been noticeable for a long time past. We append the report:

GOLD STOCKS.

	BID.	ASKED
American Flag	—	20
Bates & Baxter	25	—
Benton	—	5
Black Hawk	—	—
Central Gold	3	5
Cons Gregory	—	33
Grass Valley	6	8
Gunnell	10	—
Holman	—	—
La Crosse	—	20
Liberty	—	—
Mariposa prf.	—	—
Montana	—	—
Rocky Mount	—	5
Quartz Hill	—	15
Smith & Parmlee	—	—
N. Y. & Eldorado	—	—

Petroleum is active, even more so than its cotemporary, the gold list. With the exception of a slight advance in Bennehoff and Central, the quotations of the list are unchanged. 1000 Central were disposed of on 2d call in two equal sales at 70; 2000 shares of United Petroleum Farms changed hands in the morning session at 39, which figure seems to express the limit of that stock, as our afternoon list reports it as having declined to 37, with no sales. On the 6th inst. 800 Rynd Farm were sold at 30, a price which has been uniform with that item for a long time past. The report is as follows:

PETROLEUM STOCKS.

	BID.	ASKED
Bennehoff Run	20	—
Bergen Coal and Oil	15	—
Bliven Oil	30	—
Blood Farm	—	—
Breevoort	25	—
Buchanan Farm	35	—
Central	64	—
Clinton	—	—
Home	1 60	—
National	—	—
New York & Allegheny	50	—
Northern Light	30	—
Phillips Pet	—	15
Pithole Creek	—	1 00
Rathbone Oil	20	—
Rynd Farm	30	—
Second National	—	40
Sherman & B	—	—
Tarr Farm	—	—
United Petroleum Farms	32	40
United States	—	60

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Sep-17 tf

DEPARTMENT OF POPULAR SCIENCE.

Science and Suicide.

I HAVE often been impressed with the ignorance and stupidity of suicides. Setting aside the moral aspect of the act of self-destruction, I think this class of people have reason to be ashamed of themselves, for the bungling way in which they go about the business. They poison themselves like rats; they gash and hack themselves; they jump from high places and break their bones; they hang themselves clumsily from bed-posts—methods neither sure nor comfortable. Other ways there are, which idiots affect, such as kindling the fire with kerosene, playfully experimenting with new kinds of pistols, riding on car-platforms, or taking patent medicine—but these I leave out of the present question, as my remarks are not addressed to idiots, and if they were, would have no effect.

Several convenient methods of suicide, not open to the objection of uncertainty or painfulness, are nevertheless to be avoided by persons of good taste. Take drowning, for instance. It is probably not very uncomfortable, after the first few chokes, and that disagreeable review of all one's sins which is said to be an invariable part of the performance. But who wants to go bobbing about in the water, to be banged and bruised and nibbled by fishes, and finally pulled out in a state of flabby decay, and exhibited at the Morgue? Talk of "rest beneath the wave!" My dear sir, you will get less rest beneath the wave than in almost any other place you might select. You had better blow yourself up with nitroglycerine than drown yourself. An explosion like that is disturbing for an instant; but it is soon over, and nobody can bother you by hunting up the pieces.

If you put a revolver to your head, and pull the trigger, you have a comparatively sure thing of it; but then what a ridiculous appearance you present to the coroner's jury, and what is the use in scattering yourself around so as to spoil carpets and wall-paper? Say what you please about shooting; it is not neat, and the survivors know it. Just inspect a case of the kind before you decide upon your own plan, and you will resolve to avoid such rude and unskillful means. Moreover, it hurts, unless you are a good shot—and, strange to say, men are poor shots, even at the shortest range, when their own heads are the targets. Want of practice, I suppose.

Every kind of suicide has its drawbacks; but on the whole, I think being struck by lightning is the cleanest, quickest and most artistic. There ought to be proper machinery provided to produce this result at will. It is, of course, too much trouble to stand under a tree in a thunder-storm, get drenched, and perhaps catch one's death of cold, and not be struck by lightning at all.

One difficulty in the investigation of the physical aspects of death is the fact that dead people tell no tales. But the nature of one's sensations when struck by lightning may be pretty well inferred from two kinds of evidence; first, the nature and rate of all sensation, and secondly, the testimony of those who have been struck and temporarily killed, but afterwards revived and were "interviewed." Professor TYNDALL discusses the subject in his usual happy manner in a paper on "Death by Lightning," contained in his last book, "Fragments of Science for Unscientific People," recently published by the APPLETONS.

According to HELMHOLTZ, the transmission of the nervous current takes place at the rate of about one hundred feet per second. It takes time, therefore, for the nerves to carry to the brain a report of sensation affecting the consciousness. As TYNDALL says, if a whale fifty feet long were wounded in the tail, it would not be conscious of the injury till half a second afterwards. Then there is one-tenth of a second employed in the mere act of registering the conscious sensation; and then another half-second in conveying a message from the motor nerves back to the fifty-feet-distant wounded part. Hence, if we harpoon a whale in the tail, we may reasonably expect to have one second and one-tenth to get away in, before he will flop.

Now, any injury which should actually destroy the nerves as conductors of sensation, before they had time to carry any message, would be painless, even if it resulted in death. A bullet may be said to pass clean through a man's head in about a thousandth of a second. If it killed him, it would not hurt him. But electricity is so much swifter that a flash of lightning illuminating a moving bullet would reveal it as standing still. In a single second, electricity could pass almost from the earth to the moon. The measured duration of a flash clearing a cloud is less than a hundred-thousandth of a second. Lightning passing through a man certainly wouldn't give him a chance to know what hurt him, or indeed to be hurt at all.

Professor TYNDALL refers to well-authenticated cases of people, struck senseless by lightning, who, on recovery, had no memory of pain. I quote in his own words an interesting account of personal experience:

"Under ordinary circumstances, the discharge from a small Leyden jar is extremely unpleasant to myself. Some time ago I happened to stand in the presence of a numerous audience, with a battery of fifteen large Leyden jars charged beside me. Through some awkwardness on my part, I touched a wire leading from the battery, and the discharge went through my body. Life was absolutely blotted out for a very sensible interval, without a trace of pain. In a second or so, consciousness returned; I saw myself in the presence of the audience and apparatus, and, by the help of these external appearances, immediately concluded that I had received the battery discharge. The *intellectual* consciousness of my position was restored with exceeding rapidity, but not so the *optical* consciousness. To prevent the audience from being alarmed, I observed that it had often been my desire to receive accidentally such a shock, and that my wish had at length been fulfilled. But while making this remark, the appearance which my body presented to myself was that of a member of separate pieces. The arms, for example, were detached from the trunk, and seemed suspended in the air. In fact, memory and the power of reasoning appeared to be complete long before the optic nerve was restored to healthy action. But what I wish chiefly to dwell upon here is the absolute painlessness of the shock; and there cannot be a doubt that, to a person struck dead by lightning, the passage from life to death occurs without consciousness being in the least degree implicated. It is an abrupt stoppage of sensation, unaccompanied by a pang."

Upon such high authority as this, I would advise the amateur suicide to try lightning. He has in this course one great advantage; he can take a taste of the thing and see how he likes it. Let him call, for instance, on my friend Professor ROOD, at Columbia College, or MORTON, at the Stevens Institute in Hoboken, or MEYER, at Lehigh University, or any one of a goodly number of scientific electricians, who have the biggest of batteries at their disposal, and who would with pleasure knock him senseless. During the period which TYNDALL describes, when his intellectual consciousness returns in advance of his bodily self-control, he can reflect on the ridiculous uselessness of a dead man, and possibly give up altogether the notion of voluntary decease. In fact, I am inclined on the homœopathic principle, to consider a small dose of lightning an excellent antidote for suicide.

R. W. R.

New Publications.

REPORT OF THE COMMISSION OF INQUIRY TO SANTO DOMINGO.

This document occupies 286 pages, and is accompanied with an excellent map of the island of San Domingo, reduced from the large map made in 1858, under the supervision of the French engineer, M. MENDES.

It remains to be seen whether the report will have any effect in reviving the plan of annexation. It certainly establishes most of the grounds on which the plan was urged, and so far overthrows the objections which consisted in denials of the assertions of its friends. But it still remains a question whether we want Santo Domingo on any terms, whatever may be the value of the country or the sentiments of its people. This question is political, and hence outside the province of our journal.

With regard to the mineral products of the country, the commissioners say there is evidence of mineral wealth in various parts of the island. The geologists of the expedition report the existence of the ores of iron, of copper and of gold, with deposits of lignite, rock-salt and petroleum. Unfortunately the evidence is not particularly strong as to the value of the deposits, with the exception of the rock-salt. The gold is not enthusiastically described either by Prof. BLAKE or Prof. GABB; the copper is but slightly exploited—and, as we happen to know, the parties exploiting it came to grief; the iron ore "will doubtless in time be made available for the manufacture of pig iron," as will doubtless be the case with all iron ores everywhere. The coal of Samana and Puerto Plata is lignite of inferior quality; and the petroleum is poor stuff, what there is of it, and very scarce, such as it is.

With regard to agriculture, timber and climate, on the other hand, the report makes a brilliant showing. Even Prof. BLAKE, the geologist of the expedition, branches into complimentary allusions to these subjects, being necessarily brief and cold in his remarks on mining prospects.

A New Illuminating Gas.

OF all the thousand and one processes that have been patented and tested in this country for making a permanent gas from liquid hydrocarbons, not one, so far as we are aware, has succeeded, although the attempt has been made with great perseverance and pluck. The nearest approach to a success of any of these is a carbonizing apparatus, placed in the cellars of houses. Ordinary street gas is passed through a vessel containing benzol, and thereby considerably improved in illuminating quality. The light vapors taken up by the gas are, however, easily recondensed, and after the apparatus has been in use for about a year, the pipes will be found nearly choked up with liquid, so that but little gas can be got through them. On this point we speak from bitter experience, as for a few nights past we have been unable to obtain in our house sufficient light to read by.

A process, which promises to be successful, has, however, been invented in England by a certain Dr. EVELEIGH, whose works have been inspected, and the gas produced tested carefully by the well-known chemist, Dr. LETHEBY, who found that, owing to the low temperature employed, the gas had a much less offensive smell than ordinary gas, and its illuminating power was equal to 19.68 standard candles.

One ton of Newcastle, without any Cannel coal, produces by this process 11,000 feet of 18-candle gas, with only two grains of sulphur per 100 cubic feet.

The apparatus employed consists of a bench of iron retorts, in which the best and richest portions of the gas contained in ordinary Newcastle coal are distilled over at the comparatively low temperature of about 900 deg. Fahr. The hydrocarbon oils go over with the gas, and they are carried together to a condenser, where the oily matters are rapidly condensed, the gas passing on to its own condenser and purifier. The hydrocarbon oils are collected and passed first into a heated pan, where they are re-vaporised, the vapors being conducted to a redistillation retort charged with charcoal, and heated to a temperature of about 1,200 deg. Fahr. By passing these vapors through charcoal, it is found that they are decomposed and converted into a permanent gas, which, however, is of a lower illuminating power than that produced directly from the coal. This secondary gas is passed through a condenser, from whence it is conducted to a receiver containing the primary gas with which it is mixed, the union of the two giving a gas of very high illuminating power.

THE ENGINEERING AND MINING JOURNAL.

ROSSITER W. RAYMOND, Ph. D.,
WILLARD P. WARD, M. E.,
Editors.

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THE ENGINEERING AND MINING JOURNAL *is projected in the intent of furthering the best interests of the Engineering and Mining public, by giving wide circulation to original special contributions from the pens of the ablest men in the professions. The careful illustration of new machinery and engineering structures, together with a summary of mining news and market reports, will form a prominent feature of the publication.*

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The Examination of Mines.

A company of men, especially of foreigners, who have associated themselves to purchase and operate a mining property offered for sale, should cause the statements of the vendor to be thoroughly examined and verified before concluding the bargain. This very obvious dictate of prudence is obeyed in form by nearly all companies organized for such purposes, but we have reason to know, first, that the procedure is sometimes insincere, and secondly, that when sincere it is often characterized by ignorance and folly. We shall enumerate several points of caution, all of which—not one or two, but *all*—must be observed, if the promoters of a company would deserve praise for honesty and wisdom.

1. The person selected to examine a mine should be a mining engineer, acquainted with the mining laws, customs, history and economical conditions of the country, and skillful, not merely in mine-engineering, but in the examination and criticism of mines, which is a totally different branch of the profession. The practice of sending chemists, geologists, naturalists, military heroes, or even mining captains, to perform this difficult work, has borne much mischievous fruit. Not five per cent. even of the educated mining engineers, have had enough of the peculiar experience required to enable them to judge of new enterprises safely. Yet in numerous cases, the "expert" [illegible] in the company's prospectus is not a mining engineer, not even a scientific man in any sense, but a charlatan or a tool. Now the employment of such men is disgraceful and inexcusable. There are engineers, justly famous in this particular specialty; and no honest company needs to put up with the verdict of unknown or incompetent judges. This may seem to the younger members of the profession a cruel judgment. They do not see how they are to get experience except by practice, nor why the business should go to those who have so much already. We cannot help that; it is our honest conviction that young mine-engineers, no matter where they graduated, should not undertake a work for which they are not yet fitted; and the same opinion applies to experienced engineers of all classes, if their experience has not been of the right kind. Some of the wildest mining schemes we ever knew have received the sincere endorsement of men who were justly eminent as civil, mechanical, military or constructing engineers—yes, even as mining engineers, but in other branches of the art or other quarters of the globe.

2. The examining engineer should be beyond all suspicion of bribery. There is no use in mincing matters; a good many so-called "experts" are expert enough to take money from both sides; and a good many employers are silly enough or dishonest enough to tempt the very men on whose unbiased judgment everything depends. For instance, an engineer is employed to make an examination, and promised payment in the company's stock, or a large sum in case the property is sold. Now this may be a perfectly honorable transaction, *if the engineer is avowedly in the interest of the vendor.* He is not a swindler, any more than an honest vendor is a swindler. But when the purchaser ostensibly employs him, and the vendor makes the bargain as to pay, or the engineer is in any way interested in the purchase, the whole transaction is dishonorable. The company proposing to buy should make it absolutely clear that they would be as thankful for an exposure of their delusive expectations as for a verification of their hopes; and the engineer should be placed in exactly the same position by one event as by the other.

3. The expert making the examination should be fully advised of all the particulars of the negotiation, and should give his opinion in view of that knowledge. He ought to declare explicitly whether he advises the purchase on the terms proposed, not merely whether the vein is "well-defined" or "promising"—and other vague dogmatisms of like character, wherewith even eminent men are now and then prone to earn cheaply their fees. It is incumbent upon him to make careful and thorough personal inquiries and tests, accepting no statement from interested parties without independent verification, and ascertaining absolutely the actual economical condition of mining in the district, as well as the capacity and value of the property itself. What he cannot thus ascertain, he should openly declare to be uncertain, thus defining the exact nature of the risks to be incurred in the purchase. All these things are necessary in order that competent judges who have never seen the facts for themselves may understand on what grounds his opinion is based; but it is essential that he should give an opinion, not a mere description. What an honest employer proposing to purchase wants of his expert counsel is definite, positive advice—shall I do this thing or not? Such advice should carry the whole weight of the expert's reputation. If the circumstances do not justify him in staking his reputation in that way, then they do not warrant his clients in buying. Ambiguous, evasive or general opinions on such a point are shams and nuisances.

The Geognosy of the Appalachian System.

Two interesting papers upon this subject have recently appeared. One is the article of Professor CREDNER, of the Leipzic University, published in PETERMANN'S *Mittheilungen* (1871, *Heft.* II.), under the title, "*Die Geognosie und der Mineralreichthum des Alleghany Systems*" (Geognosy and Mineral Wealth of the Alleghany System), and accompanied with a handsomely executed geological map. The other is the able and suggestive address of Dr. T. STERRY HUNT, before the American Association at Indianapolis. We shall attempt, in the present article, not to discuss all the interesting points raised in these treatises, but to state briefly the principal question on which they take divergent views.

Professor CREDNER describes as follows the oldest rocks of the region:

"The geological skeleton of the Appalachian system and hence of the whole eastern half of the North American continent, is formed by a zone of the most ancient sedimentary rocks, extending, in varying width, from Alabama northeast to the lower St. Lawrence. Two formations compose this Appalachian zone: the Laurentian gneisses and the Huronian crystalline schists. The former, which are now typically micaceous, now syenitic in character, alternating with granites and syenites or passing into mica and hornblende schists, enclose more or less extensive intercalations of serpentine, crystalline limestone and iron ores. The schistose and veined structure of the predominant members of this formation, the remarkably constant bench-like separation of the granite and syenites, the frequently repeated alternations of subordinate iron ores, limestones and graphitic schists, with the predominating gneissic and syenitic rocks, but, above all, the occurrence of conglomerates, such as those described by HITCHCOCK, in Vermont and Massachusetts—all these phenomena testify the sedimentary origin of the Laurentian gneiss, and favor, at the same time, the notion of its originally crystalline formation. It is, hence, to be considered as the product of the eldest ocean which covered the congealed crust of the earth.

"Closely connected with the Laurentian rocks are the representatives of the Huronian system, regular series of micaceous, talcose, argillaceous and chloritic schists, as well as of itacolumite, quartzite, limestone and conglomerates, lying, for the most part unconformably on the borders of the Laurentian gneiss-zone, sometimes following all its retreating or projecting outlines, and forming, between the separate ranges of gneiss narrow basins or steeply dipping, frequently even overturned and reversed, series of strata. Concerning the genesis of these schists, as sediments of an ocean little less recent than the Laurentian there can be no doubt. Indeed the Huronian quartzitic slates of North Carolina have furnished in large numbers what are believed to be marine fossils (Palaeotrochis)."

Professor CREDNER avoids the historic strife which revives whenever the name Taconic is mentioned, by rejecting the classification of EMMONS; but his sweeping division of the pre-Silurian rocks into Laurentian and Huronian, and especially his grouping of such heterogeneous strata under the latter title, is open to criticism. We fear that, in declining to take sides with any school of American geologists, the distinguished German will arouse the wrath of all.

Dr. HUNT, for instance, accuses him at once of falling "into the very error against which EMMONS warned American geologists, namely, the confounding in one system the ancient crystalline schists with the newer fossiliferous sediments"—viz: in ranking together as Huronian the gneissic series of the Green Mountains and the so-called lower Taconic rocks of Vermont, containing marks of annelids and crinoids. Moreover, the White Mountains are laid down on his map as Huronian, and the great spread of rocks from the White Mountains down to the sea at Portland is called Laurentian, whereas, according to Dr. HUNT, the latter clearly belong to the White Mountain series.

But this brings us to consider Dr. HUNT'S address, which possesses an almost unique interest, as the *resumé* of many laborious investigations, the reiteration and the recantation of many earlier utterances of its distinguished author. Dr. HUNT'S present propositions will certainly not meet with universal acceptance. We have already published, though without comment, that portion of his address containing a theory of the origin of crystalline rocks, to which we shall doubtless revert hereafter. His geognostic classification of the pre-Silurian rocks is substantially as follows:

I. *The Adirondack or Laurentide Series*—chiefly firm granitic gneisses, often coarse, generally reddish or grayish, frequently hornblendic, seldom or never highly micaceous, destitute of intercalated mica-

schists and argillites, but inclosing quartzites, pyroxenic and hornblendic rocks, associated with crystalline limestone, graphite and immense beds of magnetic iron ore.

II. *The Green Mountain Series*—quartzo-felspathic rocks, largely occurring as fine-grained eurite, though often a true gneiss, more micaceous than the Laurentian, pale greenish or grayish in color, inclosing massive stratified diorites, epidotic and chloritic rocks, steatite, dark-colored serpentines, ferriferous dolomites and magnesites, intimately associated with beds of slaty hematite, and occasionally of magnetite. This series frequently contains chrome, titanium, nickel, copper, antimony and gold. The gneisses often pass into schistose micaceous quartzites, and the argillites, which abound, frequently assume a so-called talcose character, though in reality not magnesian, but essentially hydro-micaceous. They are sometimes black and graphitic.

III. *The White Mountain Series*—predominantly mica-schists, interstratified with micaceous gneisses, the latter less strong and coherent than the Laurentian, light-colored from white felspar, and generally fine in texture, though sometimes coarse-grained and porphyritic; and the former richer in mica than the foregoing series, (especially in crystalline tabular muscovite) more or less friable, and presenting every variety, from coarse gneissoid down to fine schistose, passing into argillite. The cleavage is generally coincident with the bedding, but the plates of mica are often, in the coarser varieties, disposed at various angles to the cleavage, showing that they were developed after sedimentation by crystallization in the mass; a circumstance which distinguishes them from more recent rocks, derived from their ruins.

This series contains, moreover, dark hornblendic gneisses and schists, occasionally passing into garnetiferous hornblende-rock, also crystalline limestone, sometimes with pyroxene, garnet, idocrase, sphene and graphite, and intimately associated with highly micaceous schists containing staurolite, andalusite, cyanite, garnet, plumbago, etc. Here also are placed Dr. HUNT'S "concretionary granitic veins," carrying beryl, tourmaline, lepidolite, and occasionally tinstone and columbite. It is confessed that these White Mountain rocks closely resemble the Laurentian, though the schists are more micaceous, and some of the minerals in the granitic veins have not yet been found in similar Laurentian formations.

These three series Dr. HUNT traces lithologically through the Appalachian range, and finds them parallel in other parts of the country, and in Europe. He does not positively assert the third series to be the latest. That is a point which lithological evidence cannot directly settle, when stratography is silent. But he evidently believes such to be the case, and adduces facts pointing that way, to say nothing of the strong bearing of his theory of the genesis of crystalline schists, according to which the hornblendic or chloritic must be the more ancient and the micaceous the more recent. This harmonizes, perhaps, with the observations of those (including Dr. HUNT) who profess to recognize cycles of sedimentation; though a difficulty suggests itself with regard to these cycles—namely, that they can scarcely be expected to explain two different sets of phenomena, to wit, the alternation of distinct classes of sediments in the same series, and the alternating predominance of one or the other class in different series.

We shall pursue this subject further next week.

The Use of Powerful Explosives for Splitting the Stumps of Large Trees.

An engineer employed in the French forestry service describes a novel use for dualin or dynamite. He has employed these explosives successfully and economically for splitting the knotty roots and stumps of large trees, which it was almost impossible to master by the ordinary means. The holes in which the dynamite was placed were bored from 12 to 18 inches in depth and tightly tamped.

We had heard of the use of gunpowder for the same purpose, but we were not aware that any of the stronger explosives had been applied, though we had no doubt that they would give much better results than the former material. The force of the explosion of dualin, for instance, is so great that it would tear the stump to pieces, before an opening would be made to allow the escape of the gases generated.

MINING SUMMARY.

Colorado.

SUMMIT COUNTY,

The Rocky Mountain *News* of Nov. 1, has the following correspondence, dated:

BRECKENRIDGE, October 20.—About half a dozen companies are yet working, but will have to shut down in a few days. Mr. KING is developing his lode in Pollock district, and is getting out some of the finest looking ore I have ever seen. Large chunks are taken out covered with gold. There are now about twenty free-gold bearing lodes discovered in the county, all but one during the past season. The majority of them are located in Ten Mile district, and the whole of them prospect large, and will make a "good show" next summer. CARNEY, CRAWFORD & Co., some time since, found a silver lode near the county line, between the Arkansas and Ten Mile, which contains ore in paying quantities. Mr. BIRT also made a discovery of silver below Gold hill.

GREENLEAF & FULLER are putting up a twenty horse power steam saw mill on the South Swan, with which to supply the lumber for their ditch. They will construct as much as possible during the winter, and expect to have the first section, four and a half miles from the South Swan to the head of Hamburg, completed in time for use in the spring. It will be flumed; will be four feet eight inches wide at the bottom, and six feet at the top, and boarded up six feet should the water be sufficient to fill it. The flume when completed will be covered with slabs to keep out the snow. By this they will be able to work several weeks longer a season.

WILLIAM MCFADDEN has sold his interest in Illinois gulch to COLONEL FULLER for $5000, and his interest in a new discovery of placer ground near Indiana gulch to JAMES MCNASSAR; of Denver, for $800. The population of the county will be about sixty this winter. The St. Lawrence company at Montezuma will complete their Arey furnace as near as possible during the winter, and have let two more contracts on their lodes, the Silver Wing and Napoleon. The ore from both increases in value as the tunnels are driven. About twenty-five men will be employed there this winter. The Boston company, at St. John, will work a number of men on their lode and their new works. I am informed that a number of other lodes in that section are turning out some very rich ore, but will have to postpone a visit there until spring.

The season is ended, which, although not as profitable as could be desired, was, all sections considered, better than it might have been. Considerable placer ground was discovered and developed; many miles of ditches were constructed; and about twenty free-gold-bearing lodes were discovered, and a number of silver. The Arey furnace, at Montezuma, affords a pleasant contrast to the worthless mills in that section, and will supply a long needed market for the ores of that vicinity. But this one furnace is not sufficient judging by the number of lodes and the quantity of ore that could be furnished. Are there not others interested there who can induce—if not able themselves—the construction of additional ones next spring?

The same paper contains also a correspondence relating to

THE NEW DISCOVERIES ABOUT MOUNTS LINCOLN AND BROSS.

MONTGOMERY, October 28.—A great change since my first visit, nearly three months ago, has taken place on Mounts Lincoln and Bross. At that time about eight discoveries were made, but now there are several hundred, and perhaps as many more will be found next spring and summer. Concerning those on Mount Bross I will mention that the Moose, owned by MYERS, PLUMMER & DUDLEY, is opened about four hundred feet in length, and in depth is about twenty feet, The vein is about two feet wide and the ore averages, by assay, $460 per ton. The company are shipping thirty tons of ore to Swansea, Wales; cost of shipment will not exceed $70 per ton. This company also own the Dwight, which is developed similar to the above, and contains about the same grade of ores. Ten tons from this will be shipped, making forty tons in all. The Fairview, owned by MYERS & PLUMMER, has been traced several hundred feet The depth is ten feet, which shows two veins, one of galena two feet wide, and the other of honeycomb quartz eighteen inches wide. The latter prospects well in gold. The Tar Heels, owned by BURROUGHS & Co., though only sunk six feet, assays $800 per ton. The Park Pool associations own numerous veins on both mountains, all of which contain good ore, This association was organized by JUDGE STEVENS, who has an eye to business and will obtain the lion's share by the transaction. Messrs, SAFFORD, SYKES & Co. own four on Mount Lincoln, one of them, the Muskox, contains ore equal to any yet found; two assays recently made by PROFESSOR SCHIRMER gave $473 80 and $1,326.50. A. M. JANES owns seven veins on Mt. Lincoln two on Mt. Bross and three near the head of Blackskin gulch, which assay up to $700 per ton. The discoveries have been pre-empted as "lodes," "ten acre lots," "one hundred and sixty acres" and "fifteen hundred feet square." Mr. STEVENS, I am informed, started the "acre" method and called it "placer ground." He might just as well pre-empt a homestead in Lake Superior.

To mention all those discovered would be a difficult task, and as the description of one will answer for all I will merely give my opinion of the whole, which is, considering the brief time since the present discovery was made—the last week in July I believe—the amount of ore brought to light is astonishing not only as to quantity but the quality. The greatest depth on any of them does not exceed twenty feet. The veins enter the limestone varying in width from one to twenty feet. The ore in some cases is attached to the rock, but in the majority of them is free, and as taken out leaves two solid walls at all angles to horizontal.

From the *Miner* of Oct. 26:

Work has commenced on a lode near Silverplume, that has fifteen feet of pay rock.

The Eaglebird, Sherman mountain, is yielding good milling ore. This mine is paying expenses and something besides.

The BRYAN BRO'S have leased of JOHN FILLIUS the Quaker lode, Sherman mountain. This mine produces good milling ore in considerable quantities.

The Eclipse tunnel, Griffith mountain, is now in 450 feet. In the last 50 feet the workmen have encountered very hard rock. The rock, now, however, is growing easier to work, and the indications are that the tunnel is approaching a vein.

We have positive information that smelting works will be erected at Guilberson ranch, six miles below Georgetown. The gentleman who has the matter in hand, has ample means, and is having great success in the States and Territories west of us, in the treatment of ores, by smelting. The machinery for these new works is on its way to this country now.

We learn from CAPT. THOMAS J. DEAN, of Idaho, that the mines in that district are producing ore at the rate of forty-two tons per week. The ore at the lowest possible estimate, will yield $100 per ton. All this ore, or nearly all, goes to Gilpin County for treatment. The Santa Fe, Seaton, and Veto are all producing good milling ore.

The Marshall Silver Mining Company are driving their great enterprise, the Marshall Tunnel, into Leavenworth Mt., with commendable zeal. Our statements made more than twelve months since, that Leavenworth mountain was veined with rich silver mines, are more than verified. We said then also, that the Marshall Tunnel was one of the great legitimate mining enterprises of the United States, and time and development have proven conclusively, that our statements then made, were correct. The results thus far obtained are satisfactory to the owners. A number of lodes cut by this tunnel are being worked on the surface, and from the tunnel also. The ore obtained is of such remarkable richness that we almost hesitate to give the results by mill treatment. But as our statements can be verified by the testimony of miners and mill-men, we shall proceed to give a few figures, to show to our readers the character and value of the belt of lodes that the Marshall tunnel has already cut.

The results formerly obtained from the workings of the Equator, our readers are sufficiently acquainted with already. We need only say that this great mine is at the present time, yielding large quantities of rich milling ore. The Compass and Square, another lode cut by the Marshall tunnel, is being actively worked, and the ore

obtained is very rich. It is now very definitely determined that the float ore, (about $30,000 has already been mined out), found in the vicinity of the Equator and Compass and Square, is the outflow of lode No. 5, another lode cut by the Marshall tunnel. The surprising richness of this float ore proves the valuable character of lode No. 5. But the developments on the mine, now going forward are of such a satisfactory nature, that the original promoter, GEN. FRANK J. MARSHALL, of this great enterprise, may truly feel elated at the triumph he has already achieved for himself and the country at large. The first-class ore taken from the mines spoken of, yields by mill treatment from $800 to $1200 coin per ton, of 2000 lbs., and the second class ore by the same process from $100 to $350 per ton.

From the same of Nov. 26 :

The ore yield of the Stevens mine, West Argentine, during the month of October, was 50 tons.

ANTHONY BARRETT and JAMES H. OSBORN have commenced work on the Cascade lode, Sherman Mountain. The Cascade has a deposit of milling ore.

The last mill run of first-class Minneapolis ore, gave a yield of $669 coin per ton, and the second class ore, by mill treatment, gave a yield of $141 coin per ton. The ore deposit in the Minneapolis is increasing in quantity and quality.

The Tunnel of the Lebanon Mining Company has been driven into Republican Mountain 250 feet. Lately the ground in the breast of the tunnel has grown quite soft, and the workmen are driving ahead at a rapid rate. This tunnel is designed to cut ground on the Guthrie and Hise lodes, owned by the Lebanon Company. They are working the Guthrie and Hise by shafts and drifts, and are obtaining good milling ore from both lodes. The Dressing and Concentrating mill of the Lebanon Company is full of ore, and doing satisfactory work. Under the Superintendency of DR. J. G. POULE, the affairs of this Company are well administered, and ere long the property will be placed on a producing basis that will be eminently satisfactory to the owners,

The Dream lode, discovered a short time since by ELI DICKERSON, JAMES SALLEE and HENRY PALMER, situated above the Young America lode, about six miles below Georgetown, is producing ore of remarkable richness. One assay of ore taken from this new wonder, gave a yield of $9,451.09 coin per ton. and another of $6,678.35 coin per ton. The crevice, so we are informed, carries a large amount of good milling ore.

The *Miner* has the following reports of shipments of bullion, Oct. 26 :

The International mill, Argentine, has shipped, bar No. 27, weighing 1020 ozs., 952 fine, $1270 coin. DR. CHEEVER is proving himself an accomplished metallurgist.

PALMER and NICHOLS have shipped during the same time bar No. 409, weighing 1486 ozs., 753 fine, $1446.77 coin, and bar No. 410, weighing 1506,95 ozs., 832 fine, $1621.03 coin.

The Stewart S. R. Co., have made the following shipment :

Brick No.	Oz. Silver.	Fine.	Coin Val.
356	1154	746	1113.03
357	1174	744	1129.27
358	1022	753	972.69

Total for the week $7573.71. Stewart is running on low grade ore. The ore shipments during the past week have been large. The total of ore and bullion shipments will amount to $20,000 .

Nov. 2 :

The Stewart S. R. Co., have made the following shipment since our last issue :

Brick No.	Oz. Silver.	Fine.	Coin Val.
359	1036	749	$1003.26
360	1010	769	1004.24
361	1006	738	959.93
362	974	779	981.01
363	1094	788	1069.18
365	1133	748	1095.72
366	1149	754	1120.16
Also Lead Bars,			
75	954	504	621.62
76	979	345	436.73
			$8,291.85

The mill is running ⅔ of its work on second and third class Terrible, and the other battery on small lots of ore, viz : Munsell, Scotia, Prince Albert, Coney and Minneapolis lodes, varying from 62 ounces to 598 ounces per ton.

The International Mill Argentine, has shipped bar No. 28, 1015 ozs., 955 fine, $1400 coin.

PALMER & NICHOLS have shipped

Bar No.	Oz. Silver.	Fine.	Coin Val.
411	1468.35	804	$1526.35
412	1502.40	824	1600.66
413	1105.60	822	1173 97
			4300.98

Total bullion shipments of all the mills for the week, $13,993.88 coin.

Montana.

VIPOND DISTRICT.

The Deer Lodge City *Independent*, of Oct. 28, says :

Mr. JOHN BRANNIGAN, a quartz miner of much experience and good judgment, was in Deer Lodge last week, and from him we obtain the following facts in regard to Vipond District. The Vipond Brothers are taking a large amount of ore from a ledge called the Gray Jockey. It is over eight feet wide, and the entire ledge is good ore, averaging from $35 to $125 per ton in silver. The Viponds are furnishing BOHM & Co. with ore from some of their ledges, for which they get $60 per ton, on the dump. Mr. BRANNIGAN has sold some ore from the Juno to the same parties for which he receives $35 per ton at the mine, the purchaser being obliged to pack the rock eight miles, to the Big Hole river, where it is transshipped to wagons and hauled to Argenta, a distance of about 40 miles. A number of companies are taking out ore with the expectation of selling it to the above named firm or to WASH STAPLETON. There is an effort on foot to build a number of small furnaces near the mines the present winter, and if it be done there will be a large quantity of bullion produced the coming summer.

We clip the following from the *New Northwest*, of Oct. 28.

MINING ITEMS FROM KEATINGVILLE—THE KEATING LODE,

For one of the owners of which the town of Keatingville received its name, has probably gained a wider notoriety than any other mine in the district, not because of its excessive valuation, but its name and thorough development. The discovery was made in 1866 by Mr. JOHN KEATING and DAVID BLACKER, its present owners, and worked with arastras until the spring of '70, when the Postlewait mill was purchased and put up and reduction commenced in earnest, and since June of '70 its 15 stamps have continued to hammer away almost incessantly, not a day having been lost for want of ore. Two levels have been run in this mine, one at 100 feet and another at 172 feet depth, which have been worked north of discovery shaft 370 feet and south of it 600 feet, taking out a body of ore which has averaged $20 per ton from a crevice varying in width from 20 inches to 2½ feet. The mill is under the superintendence of Mr. SAULSBERGER, has capacity of 25 tons per day, and has paid $9000 to $10,000 per month from the date of starting up. Mr. GEO. RICHARDS, to whose courtesy we are indebted for much valuable information, has charge of the development, and is prosecuting the work with most encouraging success. KEATING & BLACKER are also owners of the

OHIO AND LEVIATHAN MINES,

Which have given incontrovertible evidence of hidden treasures. The Ohio has a 70 feet shaft on No. 1 south, and has been worked to that depth, uncovering a 3 feet crevice of No. 1 ore. They are at present driving in a 250 feet level and letting the ore rest awhile.

It is said the Ohio yields $50 per ton, and is finer gold than the Keating. The Leviathan has a 180 feet shaft, the ore from which has paid upwards of $50 per ton. Messrs. KEATING & BLACKER, both hard working, substantial men, have delved year after year in Colorado and Montana under the most adverse circumstances after the goal which has at last been reached in their present locations, and for their indomitable perseverance and pluck, deserve the thanks of every one who has the interest of the Territory at heart. The firm give employment to nearly 100 men.

THE LEFT-HAND LODE,

Situated in close proximity to the Keating, is owned by Messrs. CLANCY & DAVIS, and not a man who is familiar with the past history of never varying hard luck with which the efforts of the former have been attended, but will join us in congratulating Judge CLANCY upon his present prospects. The Left-Hand was discovered in January, 1871, by the present proprietors, and the ore from Discovery from the top to 25 feet down yielded $21 per ton. They have since stoped out 150 tons from the top to 25 feet down, which run $35. Within the past two months a second 60 feet shaft has been sunk and connected with discovery by a 209 feet level. The present developments on the Left-hand indicate it will prove one of the richest mines in the Territory. The crevice averages only 20 inches, but descend the shaft, take a lighted candle and hold it to the vein and you will find it fairly *freckled with free gold*—an artery of wealth coursing the hill from east to west, and running up to within 50 feet of the Keating, which runs northerly and southerly. KEATING & BLACKER had the Left-Hand in litigation as a spur of their lode, but the suit was amicably adjusted before trial, and the mine development continues to progress. CLANCY has 200 tons on the dump, with 600 tons in sight, and keeps the Sample mill and one arastra running night and day. The ore is remarkably easy of reduction, and the gold is nearly all caught in the batteries. CLANCY & DAVIS have three other partially developed lodes—the Gen. Washburn, Don Juan, and Morning Star. The former has a shaft of 70 feet, and the 60 tons of ore taken from it is a richer class of mineral than the Left-Hand. C. & D. have only 30 men working at present, but will soon increase the force. The next mine prominent in quartz circles is the

ALLEN LODE,

Situated about 1½ miles southwest of Keatingville, in the Iron Clad district. It was discovered by Mr. J. F. ALLEN, who owns 800 feet of it, and has run down a 60 feet shaft, and at that depth has denuded a body of rich ore of 4 feet in width, which works from $12 to $42 per ton. The Allen is now under sale to a New York company for $27,500 cash for 800 feet ; and whether or not the sale is consummated, a mill will be erected at once, and reduction commence immediately. Mr. MCLOWERY, well known to the stick-and-rule fraternity of Montana, has a "fat take" of 200 feet on their ledge. About a half-mile west of the Allen is the

IRON CLAD LODE,

Which furnishes an appellation for a little hamlet of perhaps 12 or 15 houses clustering on the hill sides in the vicinity of the mine. The discovery was made in 1866, by JNO. SPEARS, but a greater portion of the property is in the hands of other parties, of whom Mr. CHAS. G. HALLBECK and JACOB NAVE are the most prominent. The former has sunk a shaft 121 feet, and the latter 120 feet, and have taken out about 2000 tons of $30 ore from the two 200 feet levels. We believe the course of development pursued by these gentlemen to be the only wise policy in quartz development. They are proving the richness of their mine by an actual test of its extent before expending a large sum of money for mill appliances. Had this policy been adopted by the numerous companies who have been the quartz pioneers of the Territory, a great saving of capital and reputation would have been accomplished and far fewer failures have been recorded to the discredit of Montana. Mr. HALLBECK informs me that the quantity of ore now on the dump and in sight will, beyond a doubt, justify the erection of a mill in the spring. The crevice varies from 18 inches to 6 feet in width, and the ore being crushed at the Nave and Sample mills is paying the boys regularly for their labor. A north and south extension has been made on the Iron Clad, which promise as good ore as the main lead. Not far from the Iron Clad, Mr. J. J. CABLE has drove a 68 feet shaft down in what is called the

LOT WHITCOMB LODGE,

Discovering a 3 to 5 feet crevice of $25 ore ; but, like many others who have made discoveries, lacks means to go on with the reduction of his ore.

I might mention many other discoveries, but deem it superflous and encroaching too much upon the extent of your columns and patience. I may say this, however, as proof positive of the wealth of the lodes mentioned : Not one dollar of outside capital has been expended in their development, and all the money circulating in this section has been pounded out of rock taken from the hills which surround us.

Arizona.

From an interesting article in the Prescott *Miner* of October 7, we extract the following items relating to mines

IN MOHAVE COUNTY.

Starting from Cerbat, under the guidance of W. J. FEE, the first mine shown us was the "Little Chief," the ore of which is so rich in cloride that the owners of the mine—GEO. MILLER, G. GATEWOOD, GEO. DART and one other man—saved every piece of it with the view of sacking and shipping to San Francisco. The vein was narrow, but the little work that had been done upon it disclosed the fact that it had been widening. Franklin Lode we found a well-defined lode, fully four feet between the walls, and containing rich carbonate ore. The owners—WM. J. FEE, GEO. OAKEY, SAM. HEFFNER and J. RUFF—had sunk upon it to the depth of about seven feet. Little Tiger, like its big namesake at Bradshaw, carries great quantities of native silver, besides much chloride. It is owned by J. G. SLAVEN & Co., who were running a

pretty deep cut upon it. The Cupel Lode—RIDGEWAY & Co. owners—is quite a large vein, carrying argentiferous galena and carbonate ores. The Monitor Lode, owned by SOUTHWICK & Co., showed rich antimonial ore in abundance. Not much labor has been expended upon it. The Woodworth is a very large, well-defined lode, belonging to the Mohave Company, of which A. E. DAVIS, J. P. BULL and many other old citizens of Mohave county are members. The Union is a large galena and carbonate lode, upon which two shallow shafts had been sunk for the owners, C. A. LUKE & Co. The Union will yet render a good account of itself. The Vanderbilt had been pierced by a shaft to the depth of more than fifty feet, and ore from it has assayed from $200 to $700 per ton in gold and silver. From about fifty tons of ore on the dumps, we selected several rich pieces, one of which is now in our possession. Gold is predominant in this mine. The owners are W. J. FEE & Co. The Five Forks Lode stands as erect in the ground as do its military owners—Major POND, Lieutenant FLEMING & Co—on top of the ground. We found in it a shaft of about twenty feet, from which about fifteen tons of what appeared to be good milling ore was in sight.

Near by, on a small stream of water, Messrs. FEE & Co. expect to erect a furnace, or furnaces, to work the ore from their several mines. They had adobes, machinery, &c., and were very eager to give some person possessed of means or mining knowledge a good "lay out" in their mines. The Champion is one of the best defined, most compact lodes seen by us in our rambles. Upon it a good deal of work had been done. It averages four feet in thickness, and sits, or stands, very erect between talc walls. It crops out above ground for a great distance. FEE & Co. own it. Mohave Chief is an immense galena lode, belonging to the Mohave Company, upon which little work has been done. The Buckeye Lode is rich in silver. It has been prospected by shafts. The Mohave company are its owners. They also own the Savage, which is rich in carbonate. Shaft eight feet deep. The Todd, thought to be an extension of the Union, has rock yielding from $300 to $500 per ton. Owned by S. TODD & Company.

Not far from Cerbat are a great many veins which, from want of time, we dit not examine. They were, however, very highly spoken of. Among them are the Merrimac, Bob Tail and Norfolk, belonging to the Walkalip company; the Homestead, Hunkidore, Livingstone and Excelsior, belonging to LANE, THOMPSON & Co.; the Hamburg and Fri ice Bill belonging to RALPH & Co., and the Amazon and Plutarch belonging to GATEWOOD, MILLER & Co.

MINERAL PARK.

We visited Mineral Park and several of the mines near by. The Park is about five miles north from Cerbat, and is destined to become the metropolis of the district. The Keystone Lode was shown us first, and pleased us most. It appears to be the mother vein of this district. It crops out boldly for a long distance, and on the surface is very thick. Two shafts, one forty-five and the other twenty-five or thirty feet from the surface, have been driven in the vein, at either of which the ledge, at its narrowest, is about four and one-half feet thick. Then there is a cut in which not more than one-half of the ore is compressed, the vein being at a great width at this point. All the ore that had been extracted, up to the time of our visit, was what may be termed a rich sulphuret ore, with occasionally free silver and gold, the choicest specimens of which have astonished San Francisco assayers. The mine is owned by the Keystone company, who have shipped considerable quantities of the ore. Water of good quality was abundant in the deeper shaft. The Stark and Ewing Lode is another promising national bank, of immense size, on looking into the safe of which chloride, horn silver, native silver and free gold were observed, scattered pretty plentifully throughout the vein matter. When we were there the owners—Messrs. STARK & EWING—were sinking through the country rock, near by the metal, which they soon expected to strike. The Fairfield Lode—BENNETT & Co. owners—is about four feet thick, and of undoubted richness. The ore is of the class known as free sulphuret. The owners were hard at work sinking.

The Mayflower had a shaft twenty feet deep. The lode is about three feet thick and rich in silver and gold. Messrs. SAUNDERS & RIDENOUR, who own this treasure, informed us that some of their ore had assayed as high as $12,000. The Setting Sun Lode, belonging to the Walkalip company, was being prospected by an open cut, in which the body of the ore was at least four feet thick. This, too, at a depth of twelve feet from the surface. The ore is "free milling," and pieces of it have assayed $1,300 in gold and silver. The Walkalip company own this pretty thing, too. The Washington Lode had a shaft on it eight feet in depth, the bottom of which looked very encouraging. It is owned by the Keystone company. The Alabama was prospected very slightly. The ore is carbonate. The Walkalip company have the pleasure of "flopping their lips" over this, too. The Richmond is a large carbonate lode, carrying 42 per cent. lead, and 150 ozs. of silver to the ton. It is, also, Walkalip property. The Putnam, owned by BENNETT & Co., had a shaft ten feet in depth, out of which considerable good milling ore had been raised. The Telegraph was next visited. It is a large ledge of free milling ore, with some chloride. The south side of the vein had been unveiled and showed well, with the exception that its dip was a little more than we would like to see in a vein of ours.

By running a little over the hills, we soon caught up with the Dexter, a trim-looking three-feet vein, yielding milling ore, some of which had assayed $300 per ton. It had a ten-feet shaft, the work of PEROT & Co., who own the mine.

Thanking our stars that night was coming on, for we were growing tired and "dry," we soon ran afoul of the Lone Star, which blinked at us from the bottom of a thirty feet shaft, at which depth the "pay-streak" was three feet thick, and rich. The ore is of a pretty blue variety, and the lode looks quite promising, although its owners, W. F. GROUNDS & Co., started in on a slim chance, which goes to show that small and modest surface indications sometimes lead to very prepossessing developments.

Not far from the Lone Star is the Mayomensing, owned by HINKLE, ASKEW & Co., who started on a stain in the country rock, followed said stain, until at a depth of eighteen feet they were rewarded with quite a large vein of exceedingly rich quartz.

Our guides next astonishes us with the information that they were going to show us the "Golden Gate," which they soon did. But it was not that gate out of which we passed in 1862, for this Apache *pass*, and there was no 'Frisco on the back ground. No, it was merely a rich quartz lode, belonging to A. D. JOHNSON, who, by the way, was Captain of the steamer Cocopah, when we with many others first came up the Colorado in search of "shining gold."

But we have wandered from our mining trail, which leads us to the Wood Lode, upon which we found a fourteen feet shaft, sunk by CANAVAN & Co., who started in on a very small stratum and followed it until, when we were there, it had developed into a pretty fair sized ledge.

Next came the Philadelphia Lode, in which PETERMAN & Co. had driven a shaft twenty-one feet in depth, developing a pretty lode of rich quartz, and striking water. The Cedar Lode showed two and a half feet of paying ore, at a depth of thirty feet, which pleased its owners, BRADLEY & Co., who had started in on a stratum of about two and a half inches. The Herpison Lode was next viewed. It is owned by HERPISON & Co., who had on the dump about thirty tons of good milling ore.

This ended our travels among the mines, and for the following facts regarding mines near Parkerville, at the Northern end of the mountain, we are indebted to WM. J. FEE and Capt. C. L. WELBURN, who related them to us, after we had seated ourself and partaken of the best the Cap. had in the House.

First comes the Porter Lode, which our informants assured us was A No 1. It belongs to Messrs PORRTER & PARKER, who had gone down on it to a depth of twenty-fiive feet and had taken out a huge pile of free milling ore, some of which they had sent to San Francisco. Then the Defiance with a shaft twenty feet deep, was, they said, good to gaze at. And the Rosebud, the Panawa, the War Horse, the Rifleman (all galena lodes); the Antietam, with a thirty feet shaft, and two feet or more of silver-copper glance ore. The Oriental, a large Galena lode, upon which there is a shallow shaft. The Pride of Arizona, into which an open cut had been run, revealing a splendid-looking mass of ore, some of which had yielded well in gold, silver and lead. The Silver Hill lode, of painful memory, had a shaft 125 feet in depth, showing a three feet ledge of galena and sulphuret ore, which FRANK KEMP and others were taking out. In and about this shaft, in 1866, IRA WOODWORTH, Messrs. JUDSON, BAKER and BENJAMIN were murdered by Wallapai Indians, and SAM NOODLE was badly wounded. Near by is the KATY, another carbonate lode, which S. M. ATCHISON & Co., were developing. The Empire, a large carbonate ledge, belonging to REED, LAMBERT & Co., has assayed from $100 to $500 to the ton in silver. Considerable work has been done on this lode, and it bears a very good reputation. The Independence, belonging to HATCH & Co., showed well on top, but little work had been done upon it. The Tecumseh Lode, belonging to BEATY & Co., was very highly spoken of. In places on the surface, the cropings, we were told, measured eleven feet, and pieces of top rock had assayed as high as $500 to to ton.

The afore-mentioned quartz lodes, with several others not mentioned at all, are all in one short mountain range, which, as yet, is no more than half prospected. This mountain range runs from north to south and does not exceed thirty miles in length by from three to six miles in width. The ledges are mainly encased in talcose slate. The range has long been known as the "Cerbat." In 1863, Wallapai Indians carried specimens of quartz to Fort Mohave, on the Colorado river—(distant about forty miles), exhibited it to California volunteers belonging to Captain ATCHISON'S Company, who, soon after seeing the ore, started out, found and located several ledges. Soon after this, the Wallapais became hostile, killed many miners, and prospectors, robbed, others, and prevented the development of the mines until about a year ago, when WM. J. FEE and others located in the District, changed its name from "Sacramento" to "Wallapai," relocated abandoned ground, and set to work with a will. From that day to this, progression has been the order of the day in Wallapai, until to-day its busy population will number close on to 500 souls, excluding Indians, many of whom have abandoned their former mode of life and are employed packing water and wood, making adobes, etc. The mountain has, on the east, a very large valley, known as Wallapai valley; on the west is the Sacramento valley, both of which will, no doubt, soon be cultivated. All over the range are extensive groves of pinon pine, cedar and juniper, and numerous springs discharge water into ravines. The population of the district is made up of old Arizonans and Nevadans, who have labored well and earnestly and who will do better so soon as mining tools, powder, fuse, provisions, etc., become more plenty. Much of the ore will pay to ship, and should the mill now in course of erection prove a success; others will soon be erected, yet, we cannot help but think that smelting will yet prove the cheapest and best mode of working the ores of the greatest number of ledges yet found in the district.

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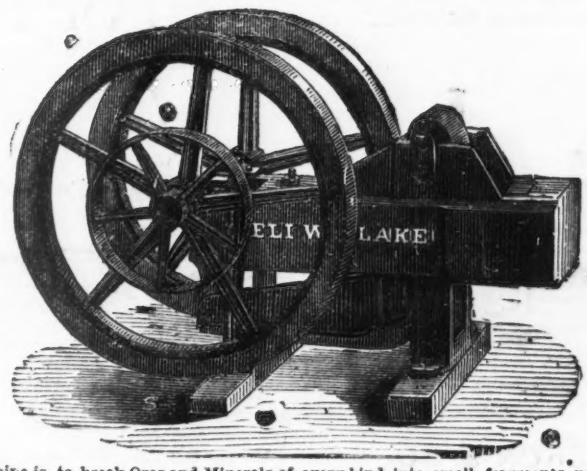

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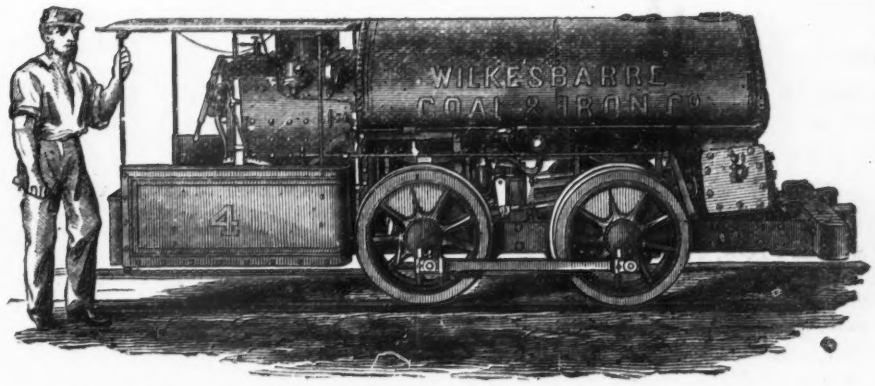

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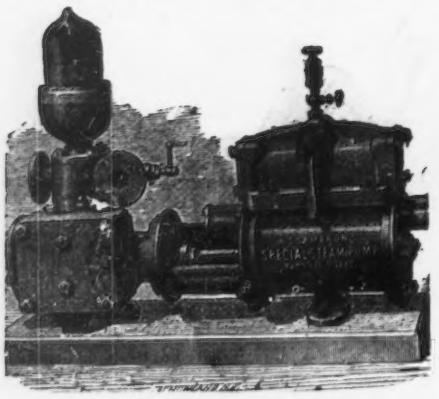

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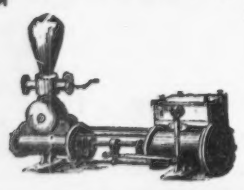

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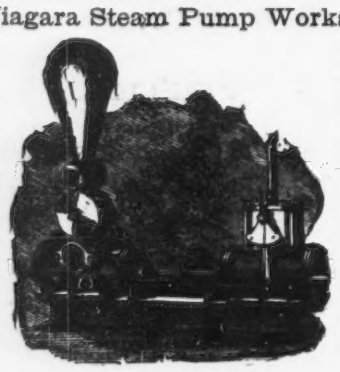

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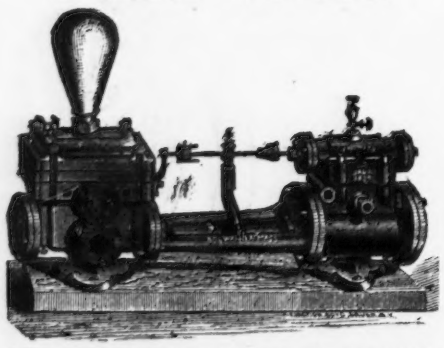

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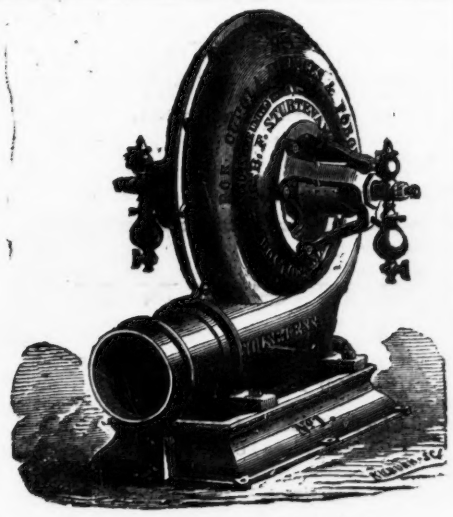

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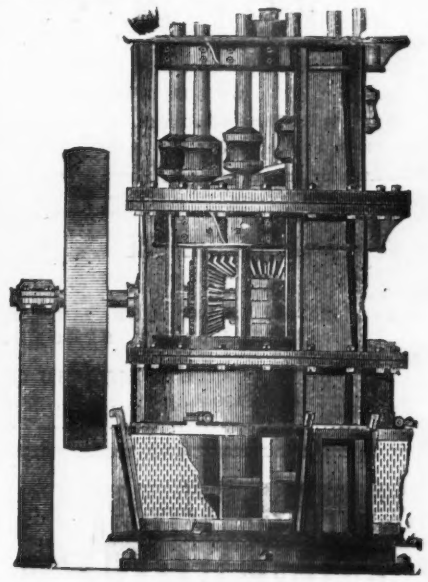

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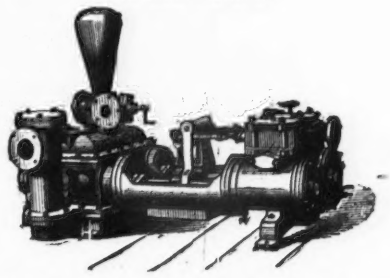

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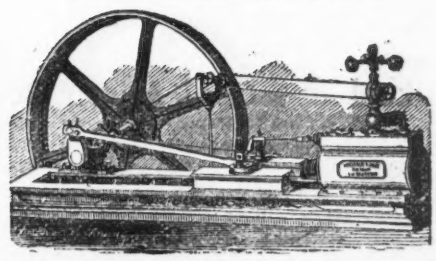

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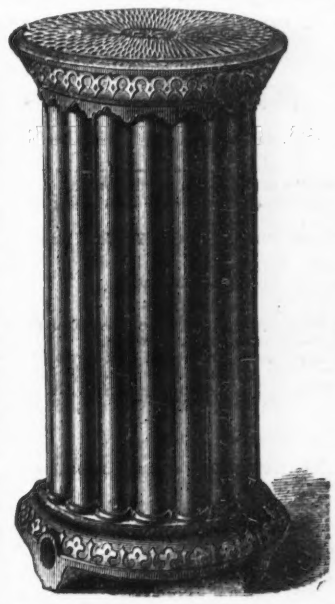

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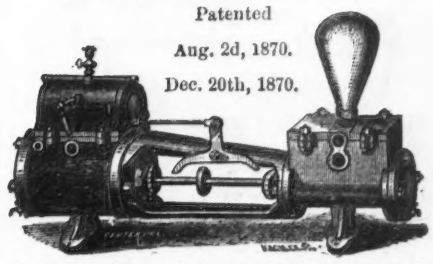

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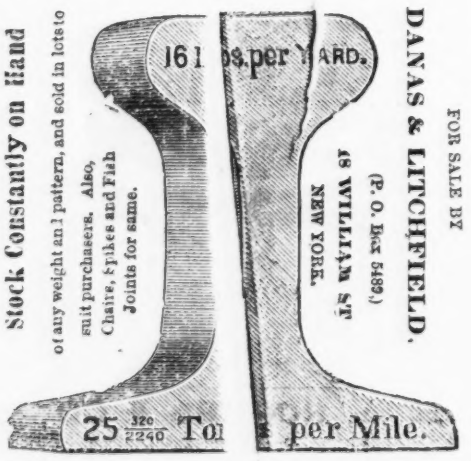
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